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MESSAGE

Attached are Article 34 Amendments for:
International Application No: PCT/IB2017/056048
International Filing Date: 30-September-2017

IN THE EUROPEAN PATENT OFFICE

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INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

International Application Serial No:	PCT/IB2017/056048
International Filing Date:	30 September 2017
Applicant:	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)
Title:	CDM8 BASED CSI-RS DESIGNS FOR MIMO
Our File No.:	1557-403PWO (P51311_WO1)

VIA FACSIMILE ONLY to: 011-31-70-340-3016
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LETTER ACCOMPANYING AMENDMENT UNDER ARTICLE 34

Dear Fonseca dos Santos:

This letter is responsive to the Written Opinion dated 25 January 2018. A Demand for International Preliminary Examination with a one-month Extension of Time was filed via facsimile on 27 July 2018 thereby extending the time limit to 30 August 2018 to file Amendments Under Article 34 in connection with the subject Application. The corresponding fee for the Demand has been paid.

Differences Between the Previously Presented Claims and the Claims as Amended

The claims have been amended to include "a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports." Support for this amendment can be found at least on pages 30, 34, 37, 39 and 40 of Applicant's Specification. Applicant has also amended Claims 7, 19, 35 and 47 to move reference designators within the claim. Applicant has amended Claims 13, 19, 26, 41, 47 and 54 to recite "code division multiplexing, CDM." Marked-up claims showing the amendments are provided in Appendix A, filed herewith.

As an initial matter, Applicant notes that the claim amendments are only made herein to expedite prosecution of the replacement claims. The amendments should not be interpreted as an admission by Applicant regarding lack of novelty and/or inventiveness of the previously presented claims.

STATEMENT CONCERNING THE CLAIMS

Item V

The Written Opinion of the International Searching Authority, Item V, states that Claims 1-56 are allegedly not new and allegedly lack an inventive step under Article 33(3) PCT in view of common knowledge in the art and the following reference:

D1 Ericsson: "CSI-RS Design for Class A FD-MIMO", 3GPP Draft; R1-157204

Independent Claims 1, 7, 13, 19, 25, 26, 29, 35, 41, 47, 53 and 54

Independent Claims 1, 7, 13, 19, 25, 26, 29, 35, 41, 47, 53 and 54 have been amended to recite, in part, "a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports." D1 fails to disclose or suggest these features.

D1 only discusses CDM-2 and CDM-4 designs. The subject matter of the amended claims pertains to a CDM-8 design for at least 24 CSI-RS antenna ports. Therefore, the amended claims are new over D1, at least in view of this feature.

Further, Claims 1, 7, 13, 19, 25, 26, 29, 35, 41, 47, 53 and 54 have an inventive step in view of D1 and common knowledge in the art. For example, various CSI-RS aggregation and CDM mapping features have different attributes and perform differently. Performance aspects to be addressed are different for each CDM Type and for each number of antenna ports. Extensive studies are required to consider various performance aspects for each combination. Thus, claiming based on a particular design type, e.g., CDM-8 in this case, and CSI-RS antenna ports, is not obvious in view of other design types. For example, there can be multiple CSI-RS aggregations and CDM mapping for CDM-8 design for at least 24 CSI-RS antenna ports, as illustrated by extensive discussion on this topic in the 3GPP fora, a few of which are [1] R1-166341, "CSI-RS design for {20,24,28,32} ports", CATT, 3GPP TSG RAN WG1 Meeting #86, August22-26, 2016, Gothenburg, Sweden and [2] R1-167996, "WF on CDM aggregation for NP CSI-RS", Samsung, Xinwei, Ericsson, 3GPP TSG RAN WG1, Meeting #86, August 22-26, 2016, Gothenburg, Sweden, noted in the priority documents. Applicant submits that it would not be obvious for a person skilled in the art to arrive the subject matter of the amended independent claims based on D1 and common knowledge in the art.

Accordingly, amended independent Claims 1, 7, 13, 19, 25, 26, 29, 35, 41, 47, 53 and 54 are novel and have an inventive step in view of D1 and common knowledge in the art.

Dependent Claims 2-6, 8-12, 14-18, 20-24, 27, 28, 30-34, 36-40, 42-46, 48-52 and 54-56

Claims 2-6, 8-12, 14-18, 20-24, 27, 28, 30-34, 36-40, 42-46, 48-52 and 54-56 are each dependent either directly or indirectly from one or another of independent Claims 1, 7, 13, 19, 29, 35, 41 and 47 discussed above. Claims 2-6, 8-12, 14-18, 20-24, 27, 28, 30-34, 36-40, 42-46, 48-52 and 54-56 are believed patentable at least by virtue of their dependency from an independent claim believed allowable. These claims recite additional limitations which, in conformity with the features of their corresponding independent claim, are not disclosed or suggested by the art of record. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

Item VII

The Written Opinion objects to various alleged defects in the international application. As different jurisdictions have different rules, Applicant will address any alleged defects at the national stage level.

Item VIII

The Written Opinion object to various alleged clarity issues with the claims. As different jurisdictions have different rules, Applicant will address any alleged defects at the national stage level.

For the above reasons, Applicant respectfully asserts that all claims are in proper form, are novel and possess inventive step.

Respectfully submitted,

Date: August 28, 2018 By: Alan M Weisberg

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APPENDIX – A

Marked-Up Claims

1. A network node (14), comprising:

processing circuitry (18) configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources in the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

2. The network node (14) of Claim 1, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

3. The network node (14) of Claim 2, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

4. The network node (14) of any one of Claims 1-3, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

5. The network node (14) of any one of Claims 1-4, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a wireless device (12).

6. The network node (14) of any one of Claims 1-5, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

7. A method, comprising:

selecting (S100) a first set and second set of reference signal resources in a subframe ~~(S100)~~;

aggregating (S102) the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration ~~(S102)~~ for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first

set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

8. The method of Claim 7, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

9. The method of Claim 8, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

10. The method of any one of Claims 7-9, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

11. The method of any one of Claims 7-10, further comprising communicating the CDM aggregation configuration to a wireless device (12).

12. The network node of any one of Claims 7-11, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

13. A wireless device (12), comprising:

processing circuitry (28) configured to:

receive a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

14. The wireless device (12) of Claim 13, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

15. The wireless device (12) of Claim 14, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

16. The wireless device (12) of any one of Claims 13-15, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

17. The wireless device (12) of any of Claims 13-16, wherein the processing circuitry (28) is further configured to map the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

18. The wireless device (12) of any one of Claims 13-17, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

19. A method for a wireless device (12), the method comprising:

receiving (S104) a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources ~~(S104)~~;

performing (S106) channel estimation based on the CDM aggregation configuration ~~(S106)~~;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

20. The method of Claim 19, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

21. The method of Claim 20, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

22. The method of any one of Claims 19-21, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

23. The method of any one of Claims 19-22, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

24. The method of any of Claims 19-23, further comprising mapping the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

25. A network node (14), comprising:

an aggregation processing module configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

26. A wireless device (14), comprising:

a channel processing module configured to:

receive a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set

of reference signal resources have up to a maximum frequency separation of six subcarriers.

27. The network node (14) of any of Claims 1-6, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a wireless device (12).

28. The method of any of Claims 7-12 further comprising communicating the CDM aggregation configuration to a wireless device (12).

29. A base station (14), comprising:

processing circuitry (18) configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources in the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

30. The base station (14) of Claim 29, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

31. The base station (14) of Claim 30, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

32. The base station (14) of any one of Claims 29-31, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

33. The base station (14) of any one of Claims 29-32, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a user equipment (12).

34. The base station (14) of any one of Claims 29-33, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

35. A method for a base station (14), comprising:

selecting (S100) a first set and second set of reference signal resources in a subframe ~~(S100)~~;

aggregating (S102) the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration

~~(S102)~~ for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

36. The method of Claim 35, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

37. The method of Claim 36, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

38. The method of any one of Claims 35-37, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

39. The method of any one of Claims 35-38, further comprising communicating the CDM aggregation configuration to a user equipment (12).

40. The method of any one of Claims 35-39, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

41. A user equipment (12), comprising:

processing circuitry (28) configured to:

receive a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports the CDM-8 aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

42. The user equipment (12) of Claim 41, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

43. The user equipment (12) of Claim 42, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

44. The user equipment (12) of any one of Claims 41-43, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

45. The user equipment (12) of any of Claims 41-44, wherein the processing circuitry (28) is further configured to map the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

46. The user equipment of any one of Claims 41-45, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

47. A method for a user equipment (12), the method comprising:

receiving (S104) a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources ~~(S104)~~; and

performing (S106) channel estimation based on the CDM aggregation configuration ~~(S106)~~;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

48. The method of Claim 47, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

49. The method of Claim 48, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

50. The method of any one of Claims 47-49, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

51. The method of any one of Claims 47-50, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

52. The method of any of Claims 47-51, further comprising mapping the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

53. A base station (14), comprising:

an aggregation processing module configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

54. A user equipment (14), comprising:

a channel processing module configured to:

receive a ~~CDM~~ code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

55. The base station (14) of any of Claims 29-34, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a user equipment (12).

56. The method of any of Claims 35-40, further comprising communicating the CDM aggregation configuration to a user equipment (12).

SUBSTITUTE SHEET 57/1

What is claimed is:

1. A network node (14), comprising:

processing circuitry (18) configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources in the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

2. The network node (14) of Claim 1, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

3. The network node (14) of Claim 2, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

4. The network node (14) of any one of Claims 1-3, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

5. The network node (14) of any one of Claims 1-4, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a wireless device (12).

6. The network node (14) of any one of Claims 1-5, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

7. A method, comprising:

selecting (S100) a first set and second set of reference signal resources in a subframe;

aggregating (S102) the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

8. The method of Claim 7, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

9. The method of Claim 8, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

10. The method of any one of Claims 7-9, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

11. The method of any one of Claims 7-10, further comprising communicating the CDM aggregation configuration to a wireless device (12).

12. The network node of any one of Claims 7-11, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

13. A wireless device (12), comprising:

processing circuitry (28) configured to:

receive a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set

of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

14. The wireless device (12) of Claim 13, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

15. The wireless device (12) of Claim 14, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

16. The wireless device (12) of any one of Claims 13-15, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

17. The wireless device (12) of any of Claims 13-16, wherein the processing circuitry (28) is further configured to map the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

18. The wireless device (12) of any one of Claims 13-17, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

19. A method for a wireless device (12), the method comprising:

receiving (S104) a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources;

performing (S106) channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

20. The method of Claim 19, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

21. The method of Claim 20, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

22. The method of any one of Claims 19-21, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

23. The method of any one of Claims 19-22, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

24. The method of any of Claims 19-23, further comprising mapping the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

25. A network node (14), comprising:

an aggregation processing module configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first

set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

26. A wireless device (14), comprising:

a channel processing module configured to:

receive a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

27. The network node (14) of any of Claims 1-6, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a wireless device (12).

28. The method of any of Claims 7-12 further comprising communicating the CDM aggregation configuration to a wireless device (12).

29. A base station (14), comprising:

processing circuitry (18) configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources in the subframe to form a code division multiplexing, CDM, aggregation configuration

for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

30. The base station (14) of Claim 29, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

31. The base station (14) of Claim 30, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

32. The base station (14) of any one of Claims 29-31, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

33. The base station (14) of any one of Claims 29-32, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a user equipment (12).

34. The base station (14) of any one of Claims 29-33, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

35. A method for a base station (14), comprising:

selecting (S100) a first set and second set of reference signal resources in a subframe;

aggregating (S102) the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

36. The method of Claim 35, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

37. The method of Claim 36, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

38. The method of any one of Claims 35-37, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

39. The method of any one of Claims 35-38, further comprising communicating the CDM aggregation configuration to a user equipment (12).

40. The method of any one of Claims 35-39, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

41. A user equipment (12), comprising:

processing circuitry (28) configured to:

receive a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports the CDM-8 aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

42. The user equipment (12) of Claim 41, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

43. The user equipment (12) of Claim 42, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

44. The user equipment (12) of any one of Claims 41-43, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

45. The user equipment (12) of any of Claims 41-44, wherein the processing circuitry (28) is further configured to map the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

46. The user equipment of any one of Claims 41-45, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

47. A method for a user equipment (12), the method comprising:

receiving (S104) a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources; and

performing (S106) channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

48. The method of Claim 47, wherein the first set of reference signal resources corresponds to a first portion of a first reference signal configuration; and

the second set of reference signal resources corresponds to a second portion of a second reference signal configuration.

49. The method of Claim 48, wherein the first reference signal configuration is at least a first channel state information-reference signal, CSI-RS, configuration; and

the second reference signal configuration is at least a second CSI-RS configuration different from the at least first CSI-RS configuration.

50. The method of any one of Claims 47-49, wherein the first set of reference signal resources in the subframe includes a subset of resources from an eight port CSI-RS resource configuration;

the second set of reference signal resources in the subframe includes a subset of resources in a different eight port CSI-RS resource configuration different from the eight port CSI-RS resource configuration corresponding to the first set of reference signal resources; and

the CDM aggregation configuration having an orthogonal cover code of length eight.

51. The method of any one of Claims 47-50, wherein the CDM aggregation configuration is an aggregation of two CDM-4 groups.

52. The method of any of Claims 47-51, further comprising mapping the selected first set and second set of reference signal resources in the subframe to a plurality of antenna ports.

53. A base station (14), comprising:

an aggregation processing module configured to:

select a first set and second set of reference signal resources in a subframe; and

aggregate the first set and second set of reference signal resources to the subframe to form a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports;

wherein the first set and second set of reference signal resources in the subframe satisfy a temporal criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources in the subframe satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

54. A user equipment (14), comprising:

a channel processing module configured to:

receive a code division multiplexing, CDM, aggregation configuration for a CDM-8 design for at least twenty four CSI-RS, Channel System Information-Reference Signal, antenna ports, the CDM aggregation configuration corresponding to an aggregated first set and second set of reference signal resources in a subframe, the first set and second set of reference signal resources;

perform channel estimation based on the CDM aggregation configuration;

wherein the first set and second set of reference signal resources satisfy a temporal criterion such that any two resource elements in the first set and second set

of reference signal resources have up to a maximum time separation of six OFDM symbols; and

wherein the first set and second set of reference signal resources satisfy a frequency criterion such that any two resource elements in the first set and second set of reference signal resources have up to a maximum frequency separation of six subcarriers.

55. The base station (14) of any of Claims 29-34, wherein the processing circuitry (28) is further configured to communicate the CDM aggregation configuration to a user equipment (12).

56. The method of any of Claims 35-40, further comprising communicating the CDM aggregation configuration to a user equipment (12).

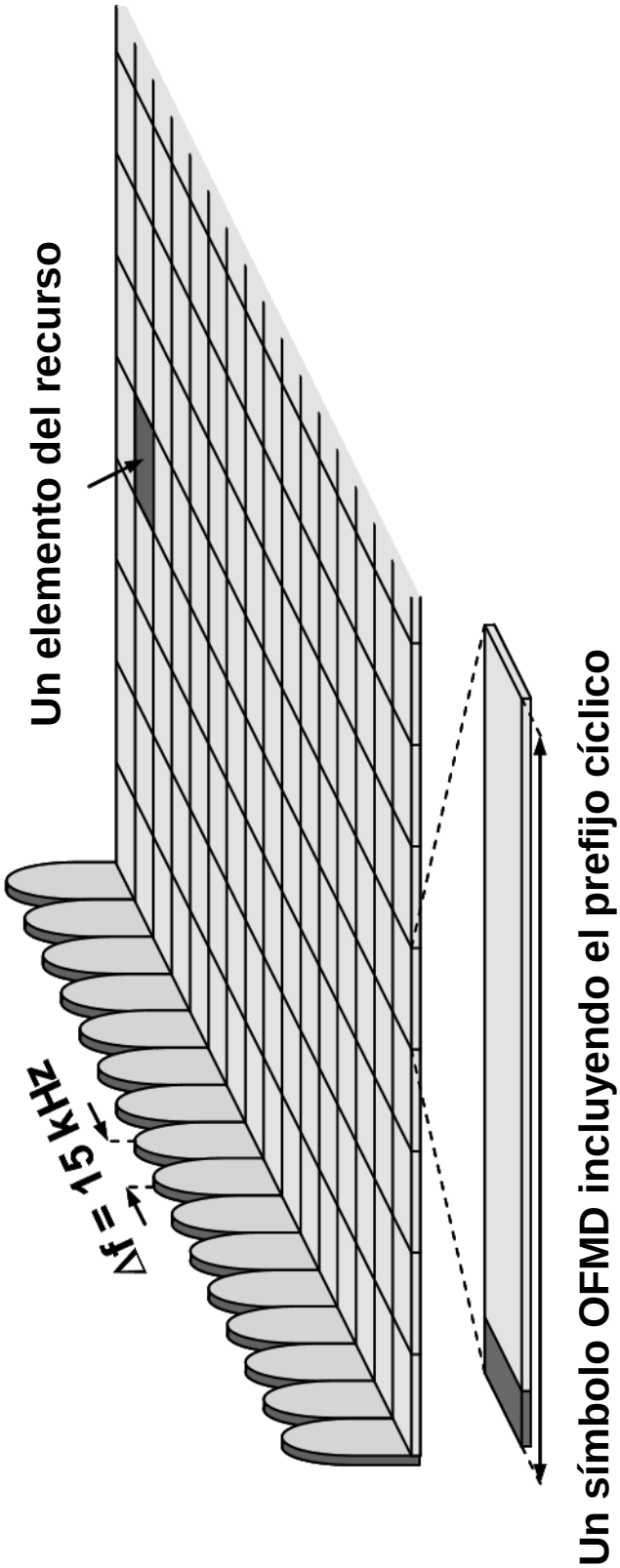

Un elemento del recurso
Δf = 15 kHz
Un símbolo OFMD incluyendo el prefijo cíclico

Figura 1

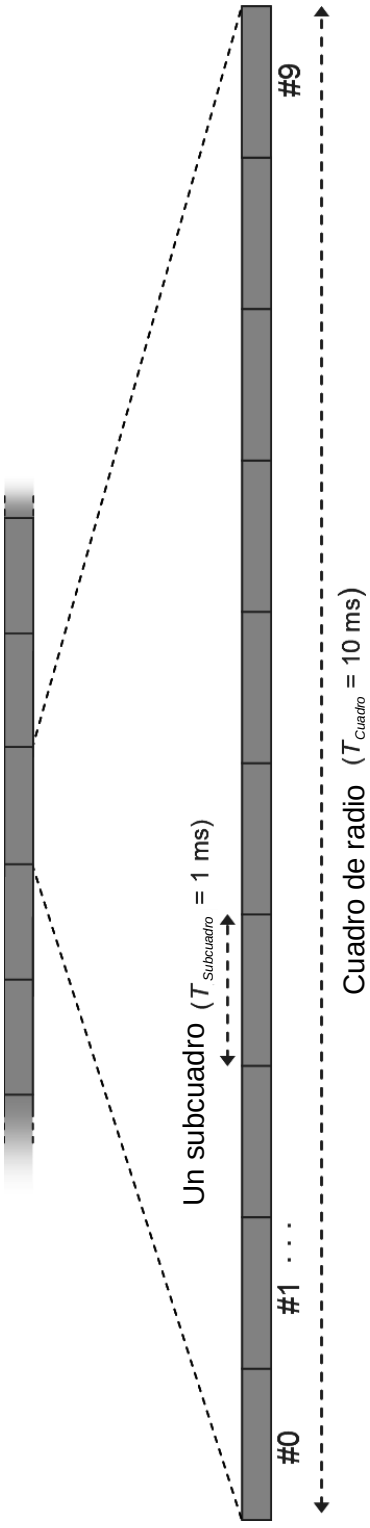

#9
#1
. . .
#0
Un subcuadro ($T_{Subcuadro}$ = 1 ms)
Cuadro de radio (T_{Cuadro} = 10 ms)

Figura 2

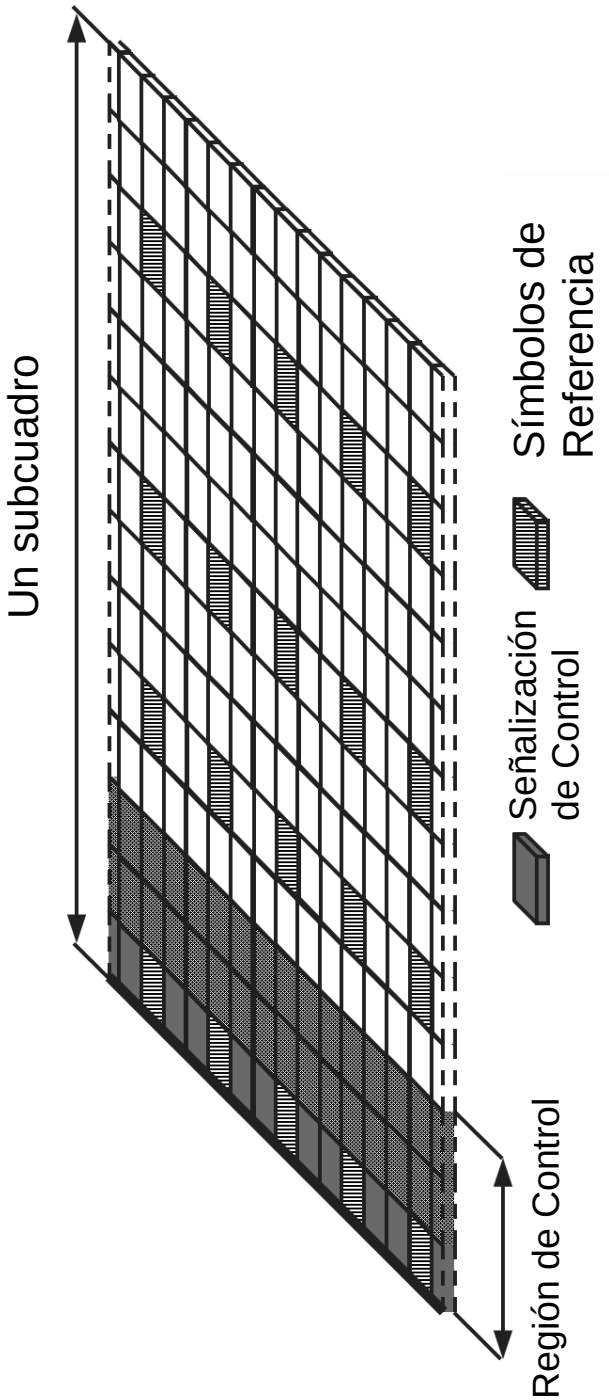

Un subcuadro
Región de Control
Señalización de Control
Símbolos de Referencia

Figura 3

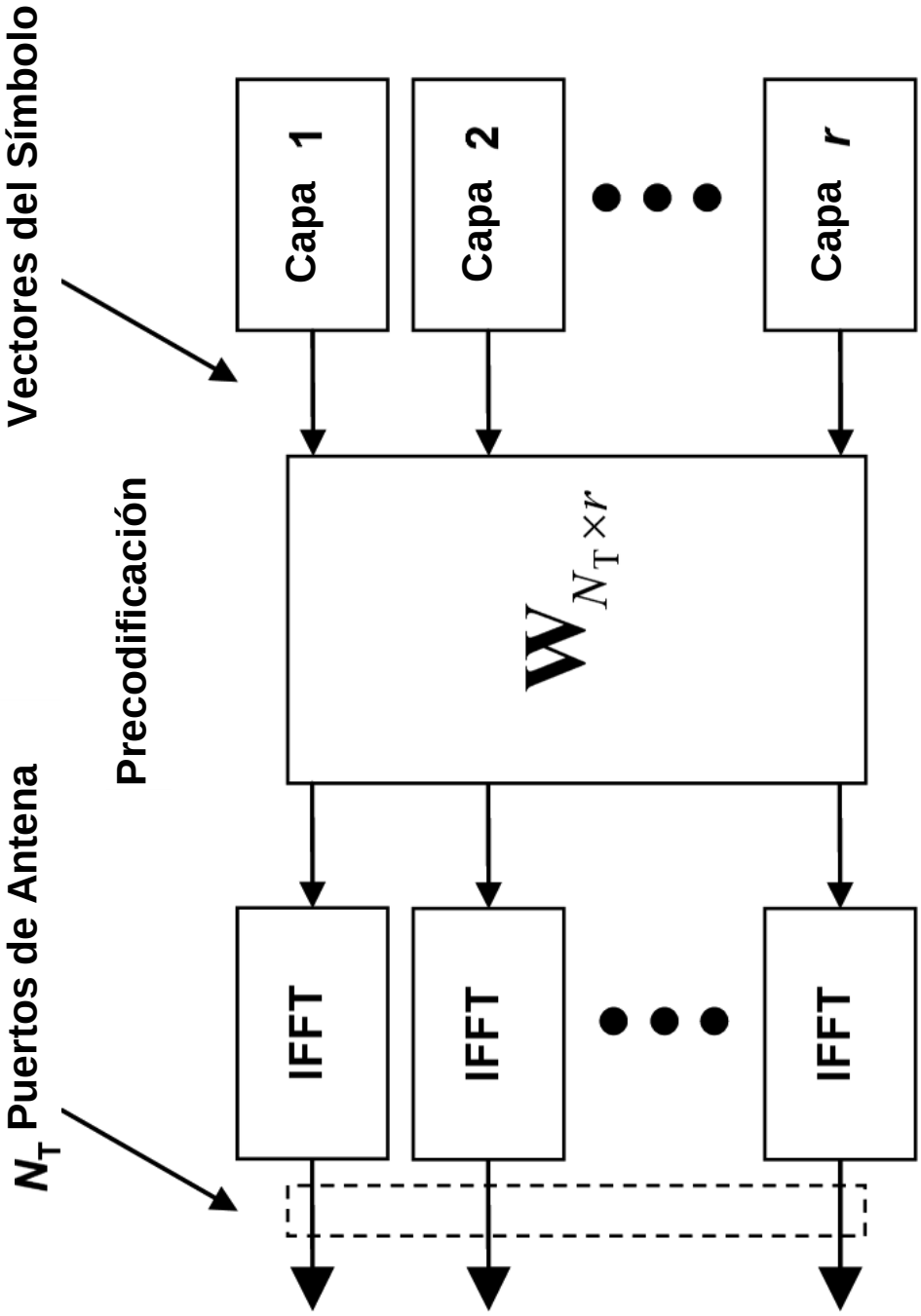

Vectores del Símbolo
Capa 1
Capa 2
Capa r
Precodificación
$\mathbf{W}_{N_T \times r}$
N_T Puertos de Antena
IFFT
IFFT
IFFT

Figura 4

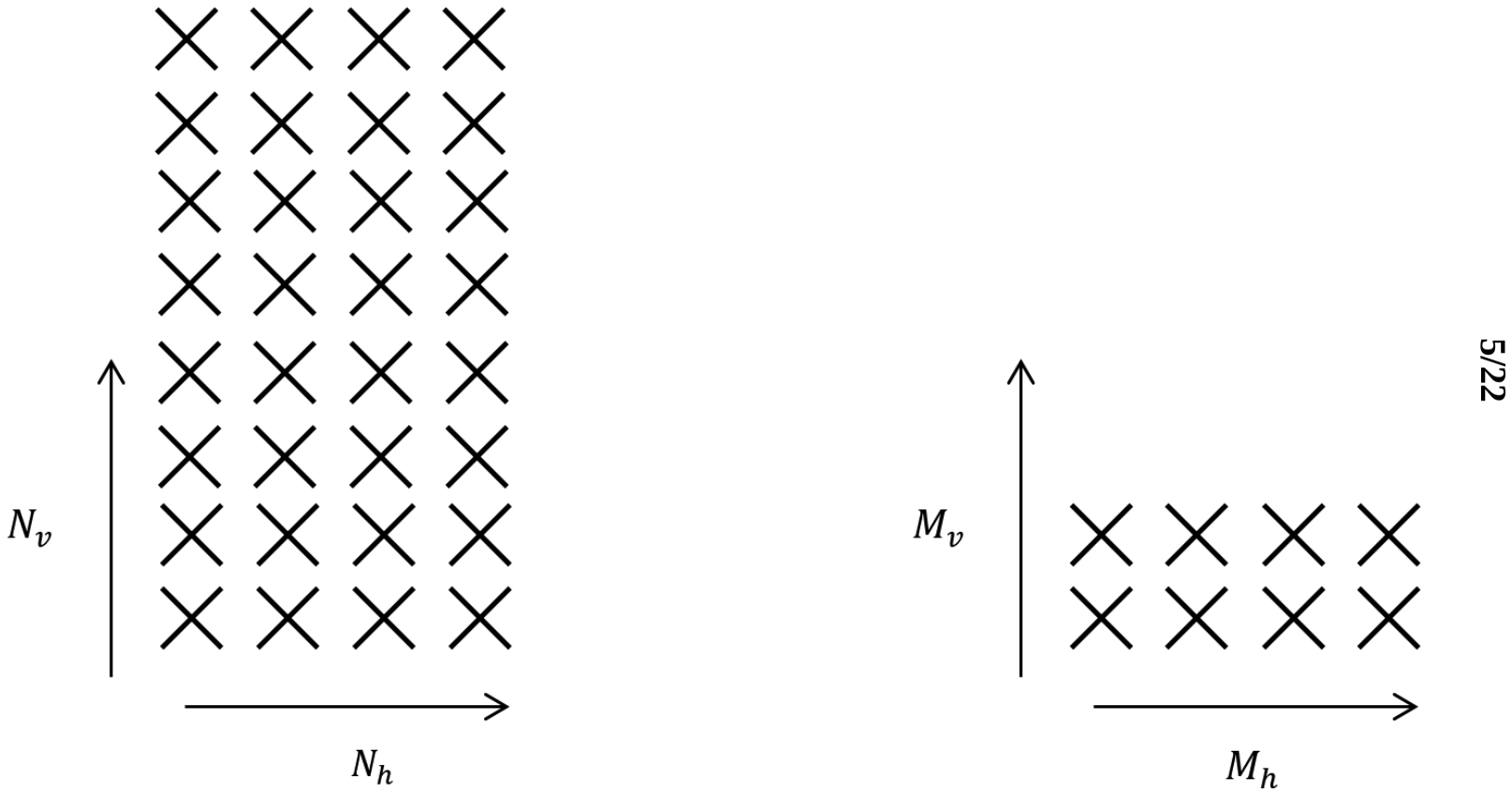


Figura 5

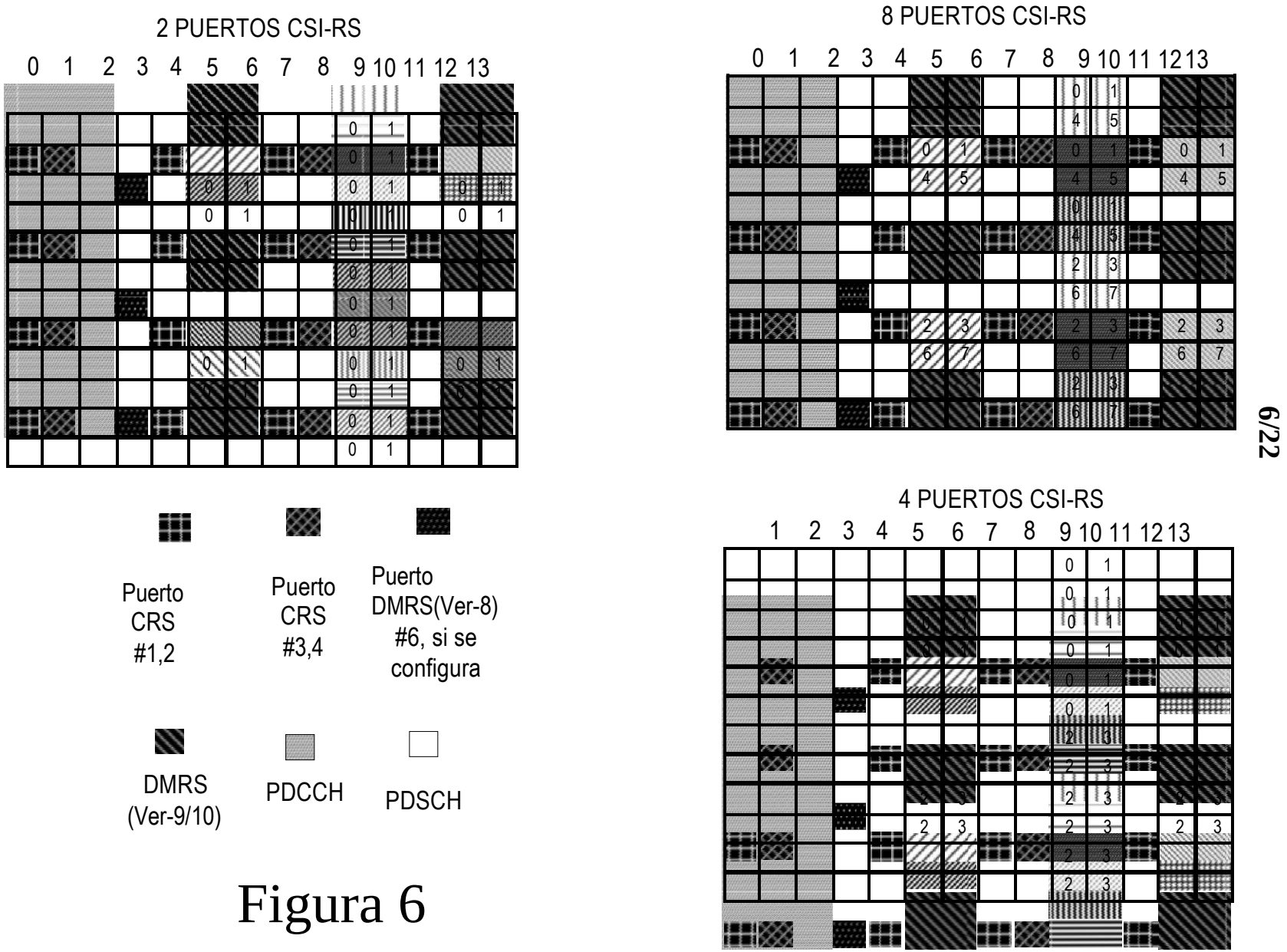

2 PUERTOS CSI-RS
0 1 2 3 4 5 6 7 8 9 10 11 12 13
8 PUERTOS CSI-RS
0 1 2 3 4 5 6 7 8 9 10 11 12 13
4 PUERTOS CSI-RS
1 2 3 4 5 6 7 8 9 10 11 12 13
Puerto CRS #1,2
Puerto CRS #3,4
Puerto DMRS(Ver-8) #6, si se configura
DMRS (Ver-9/10)
PDCCH
PDSCH

Figura 6

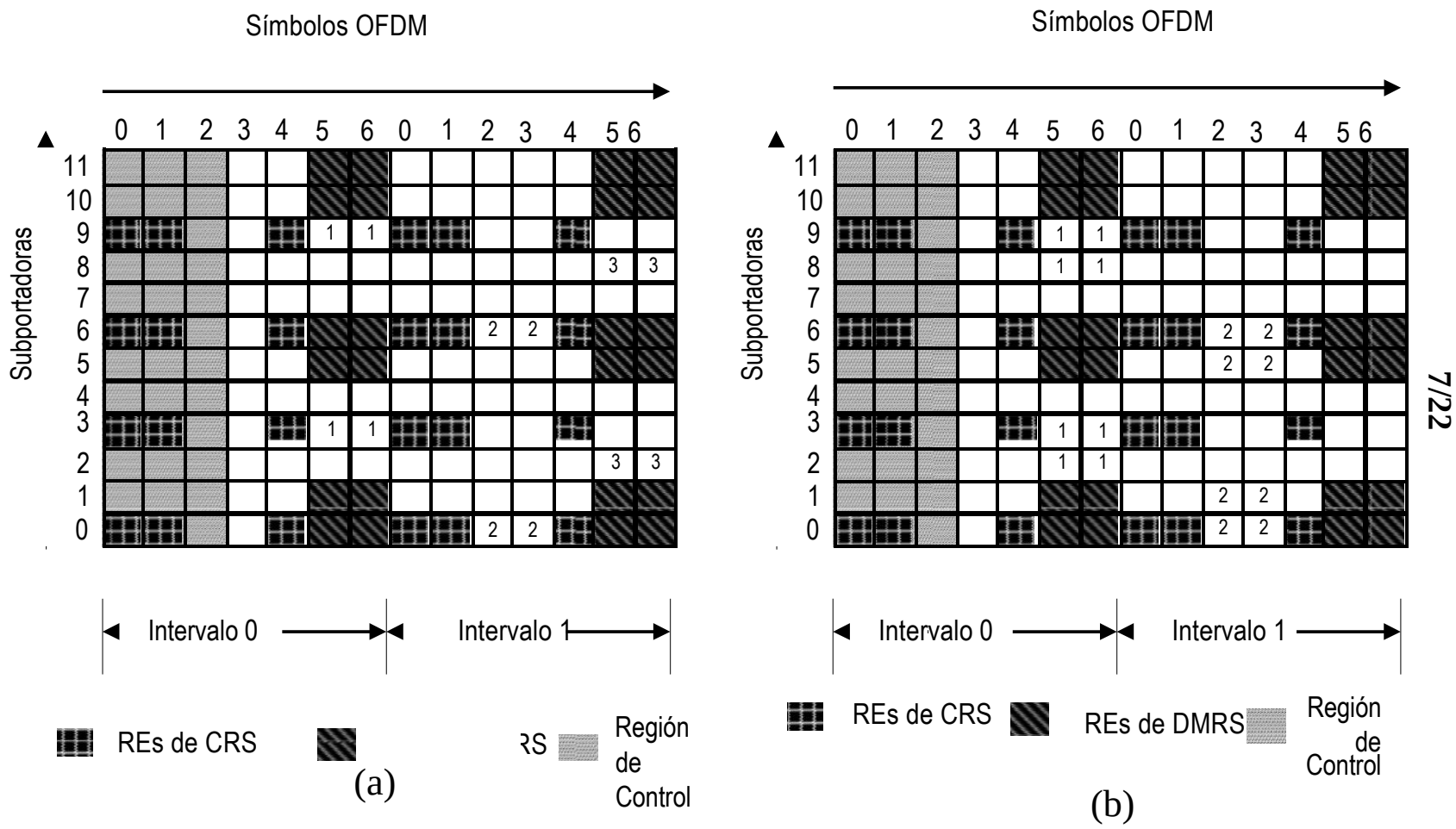

Símbolos OFDM
Subportadoras
0 1 2 3 4 5 6 0 1 2 3 4 5 6
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
Intervalo 1
REs de CRS
Región de Control
(a)
Símbolos OFDM
Subportadoras
0 1 2 3 4 5 6 0 1 2 3 4 5 6
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
(b)

Figura 7

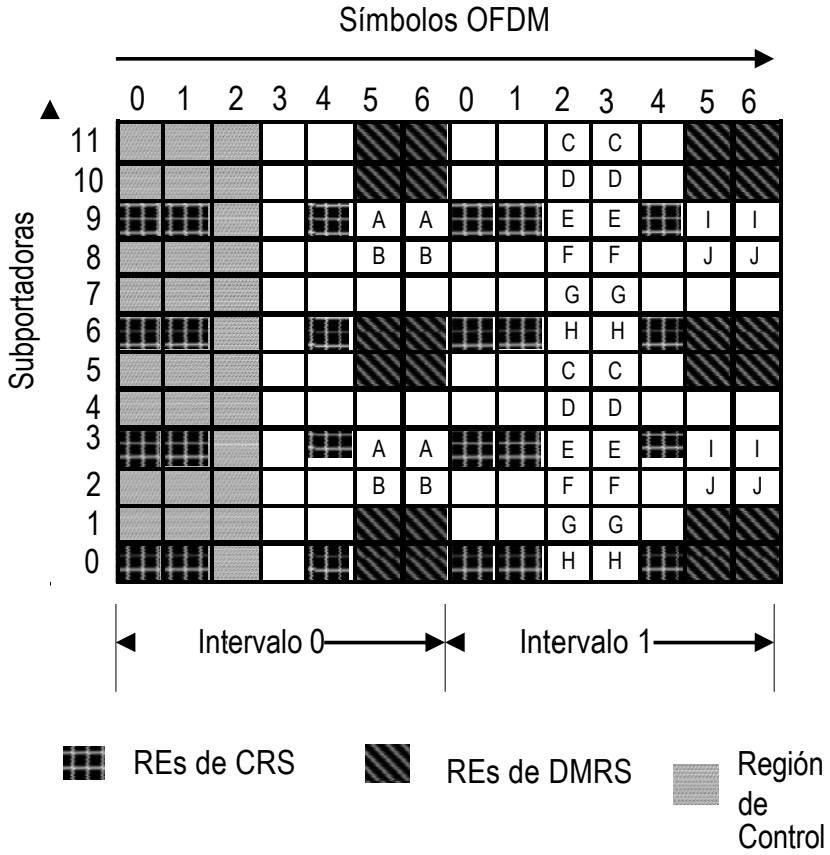

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11 10 9 8 7 6 5 4 3 2 1 0
C C D D E E I I
A A B B F F J J
G G H H C C D D
A A B B E E I I
B B F F J J G G H H
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control

Figura 8

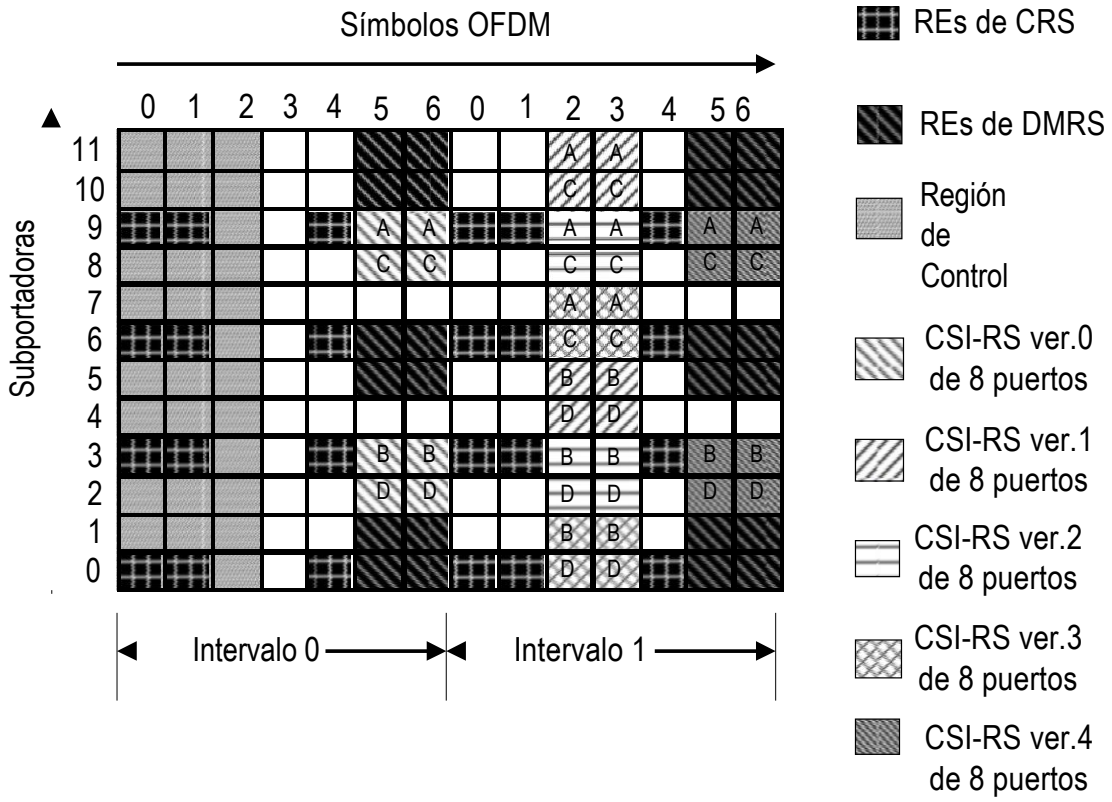

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.3 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 9

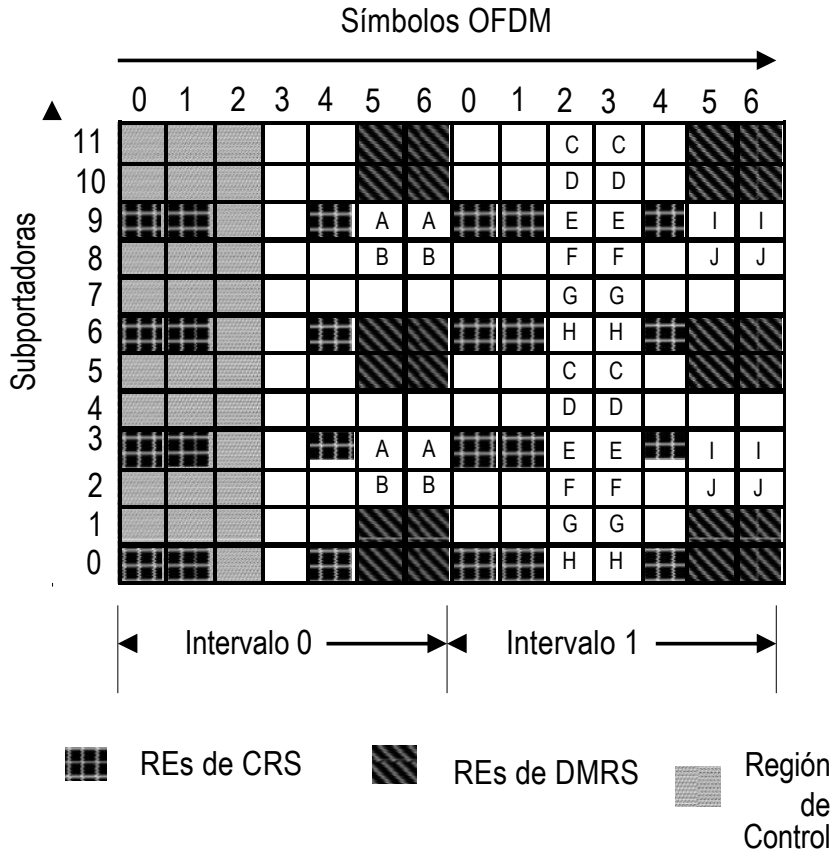

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11
10
9
8
7
6
5
4
3
2
1
0
C C
D D
A A E E I I
B B F F J J
G G
H H
C C
D D
A A E E I I
B B F F J J
G G
H H
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control

Figura 10

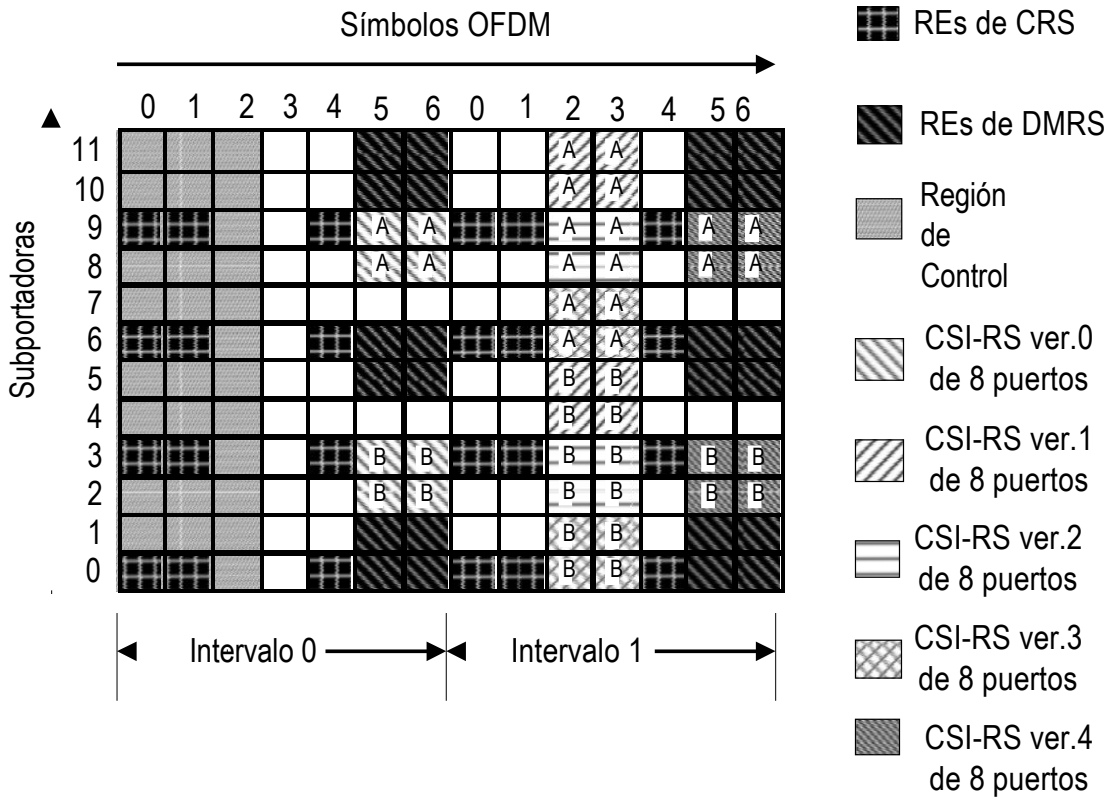

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.3 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 11

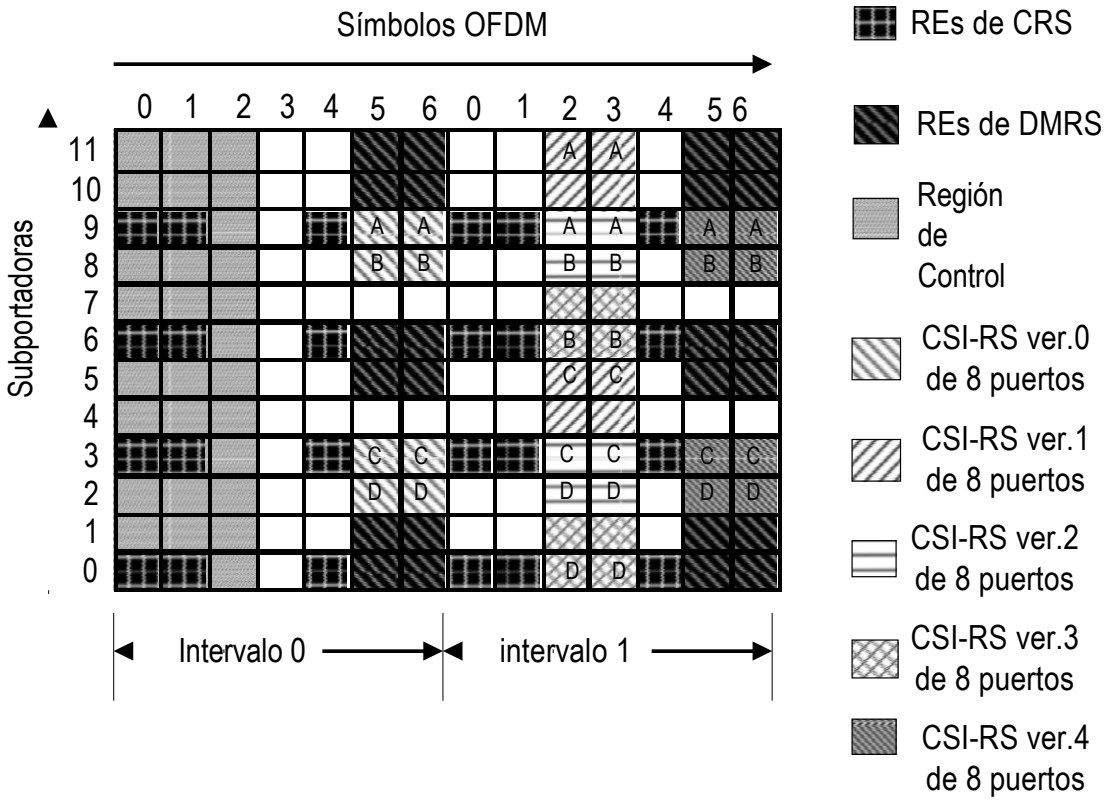

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.3 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 12

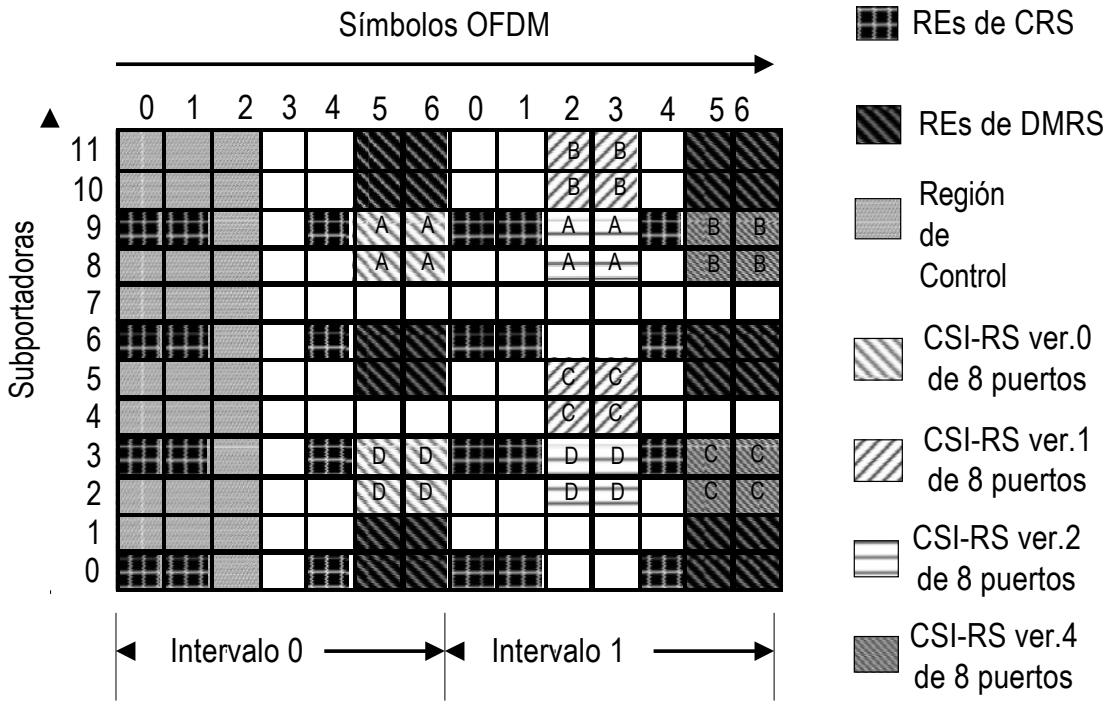

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11
10
9
8
7
6
5
4
3
2
1
0
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 13

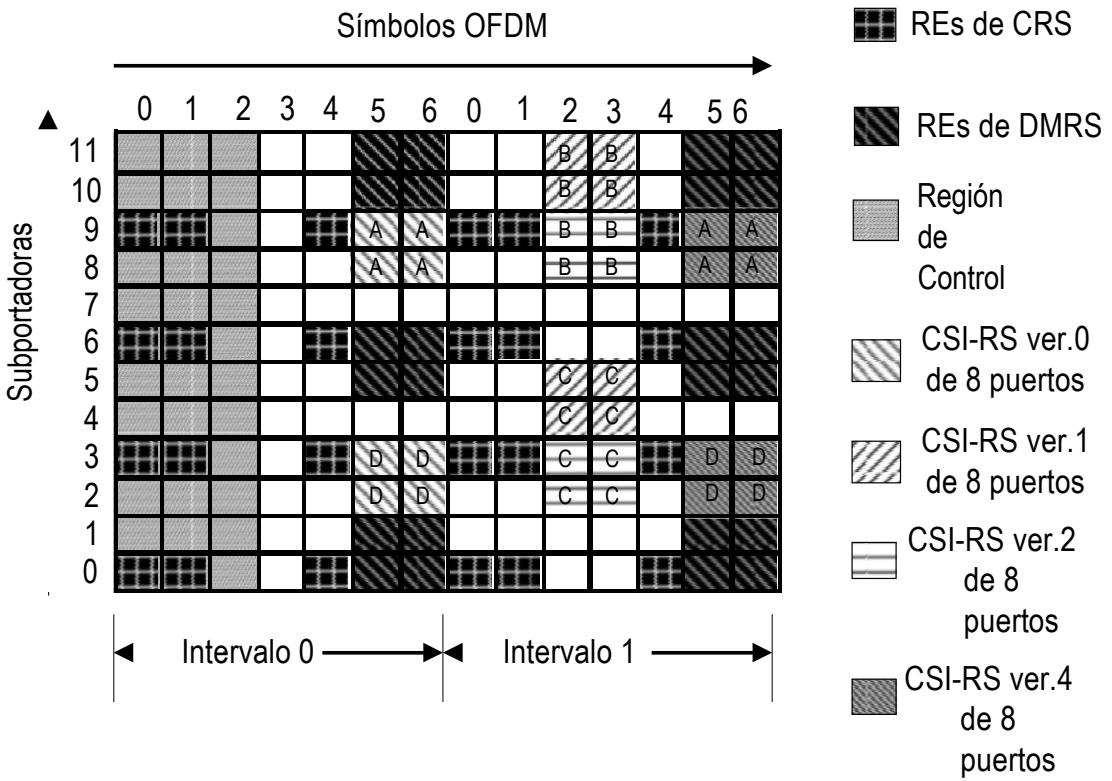

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11
10
9
8
7
6
5
4
3
2
1
0
A
B
C
D
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 14

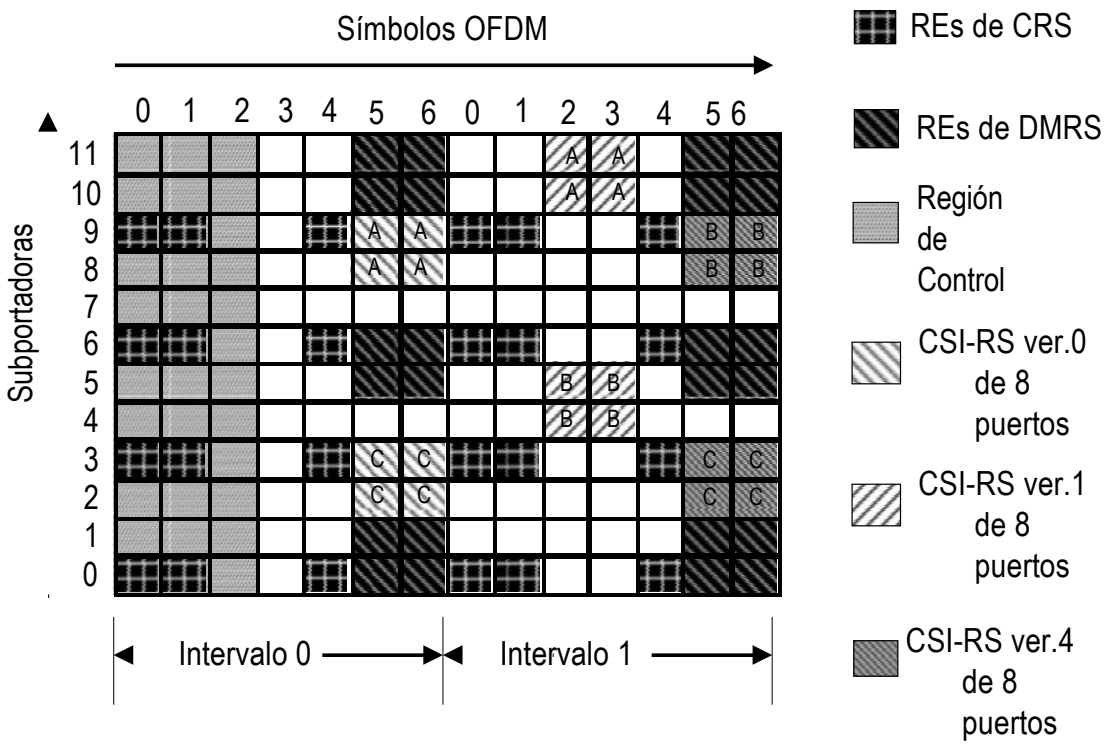

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11 10 9 8 7 6 5 4 3 2 1 0
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 15

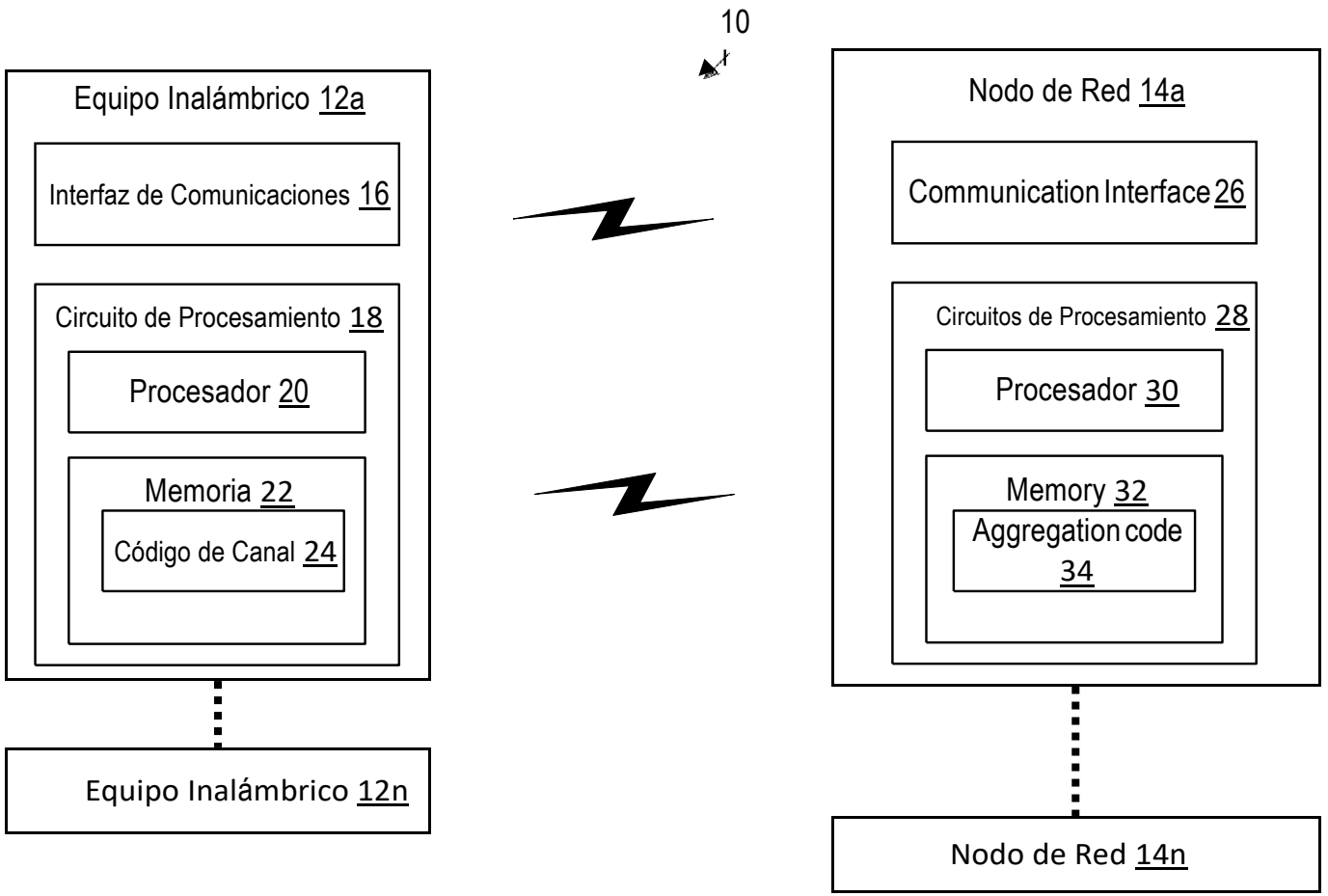

10
Equipo Inalámbrico 12a
Interfaz de Comunicaciones 16
Circuito de Procesamiento 18
Procesador 20
Memoria 22
Código de Canal 24
Equipo Inalámbrico 12n
Nodo de Red 14a
Communication Interface 26
Circuitos de Procesamiento 28
Procesador 30
Memory 32
Aggregation code 34
Nodo de Red 14n

Figura 16

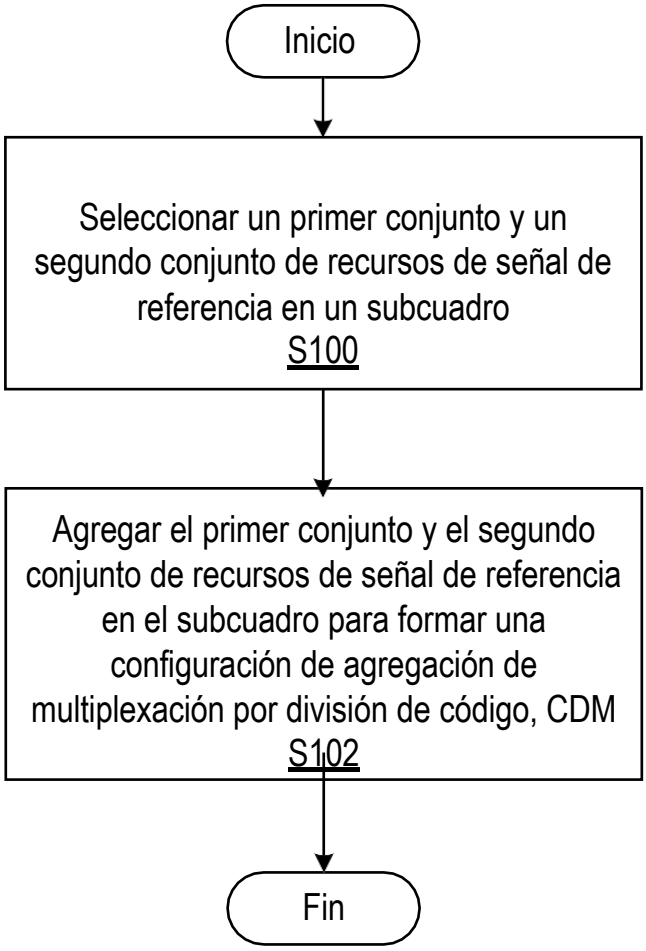

Inicio
Seleccionar un primer conjunto y un segundo conjunto de recursos de señal de referencia en un subcuadro
S100
Agregar el primer conjunto y el segundo conjunto de recursos de señal de referencia en el subcuadro para formar una configuración de agregación de multiplexación por división de código, CDM
S102
Fin

Figura 17

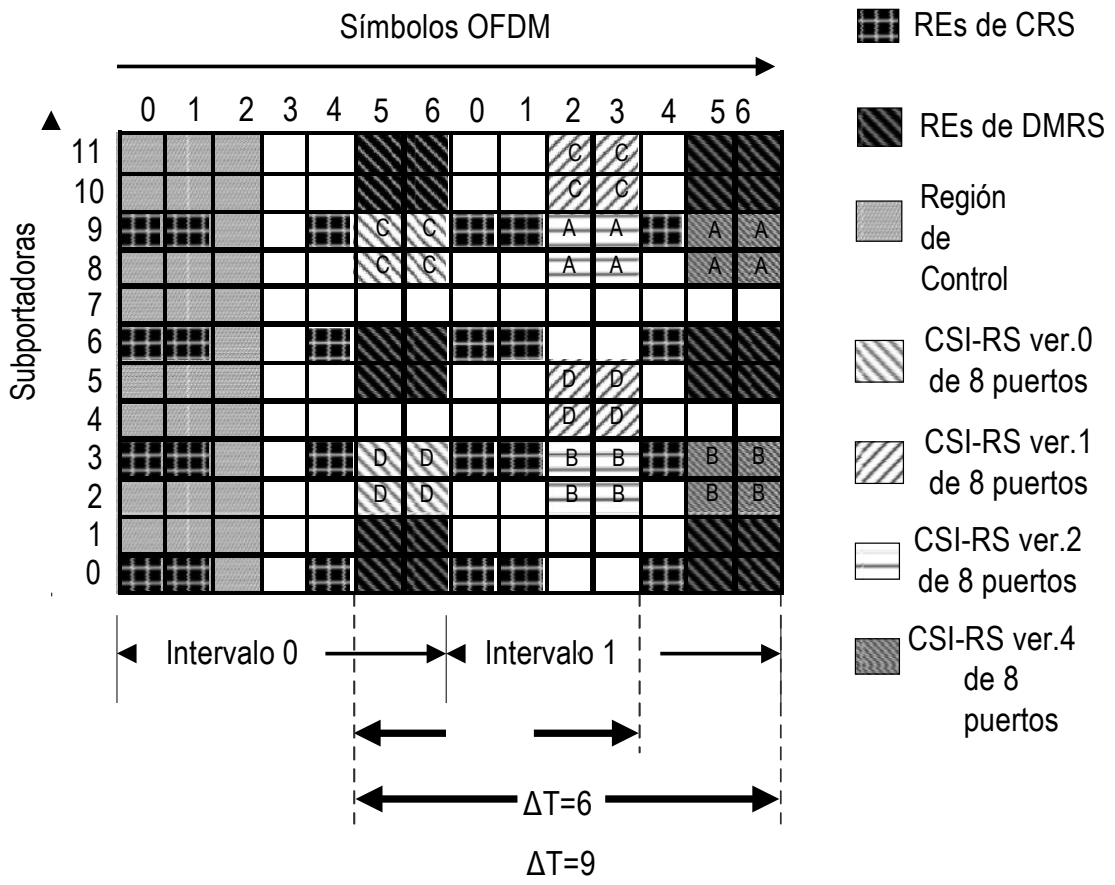

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11
10
9
8
7
6
5
4
3
2
1
0
Intervalo 0
Intervalo 1
ΔT=6
ΔT=9
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 18

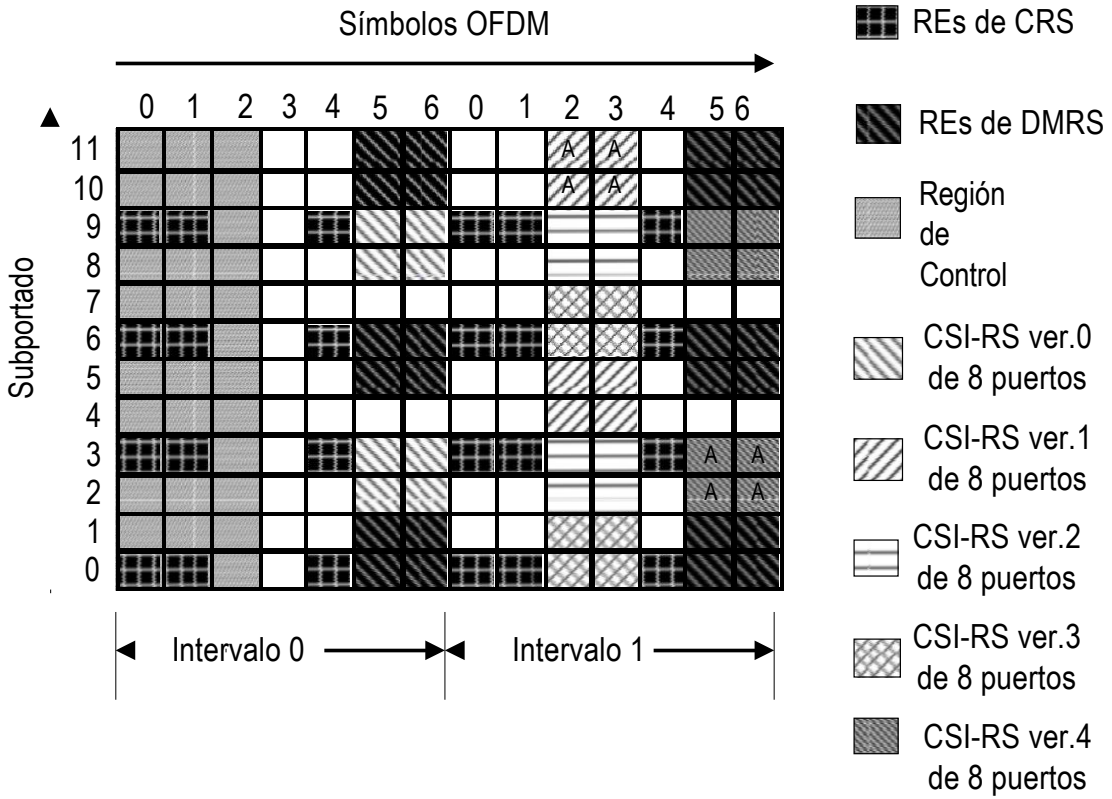

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportado
11
10
9
8
7
6
5
4
3
2
1
0
A
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.2 de 8 puertos
CSI-RS ver.3 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 19

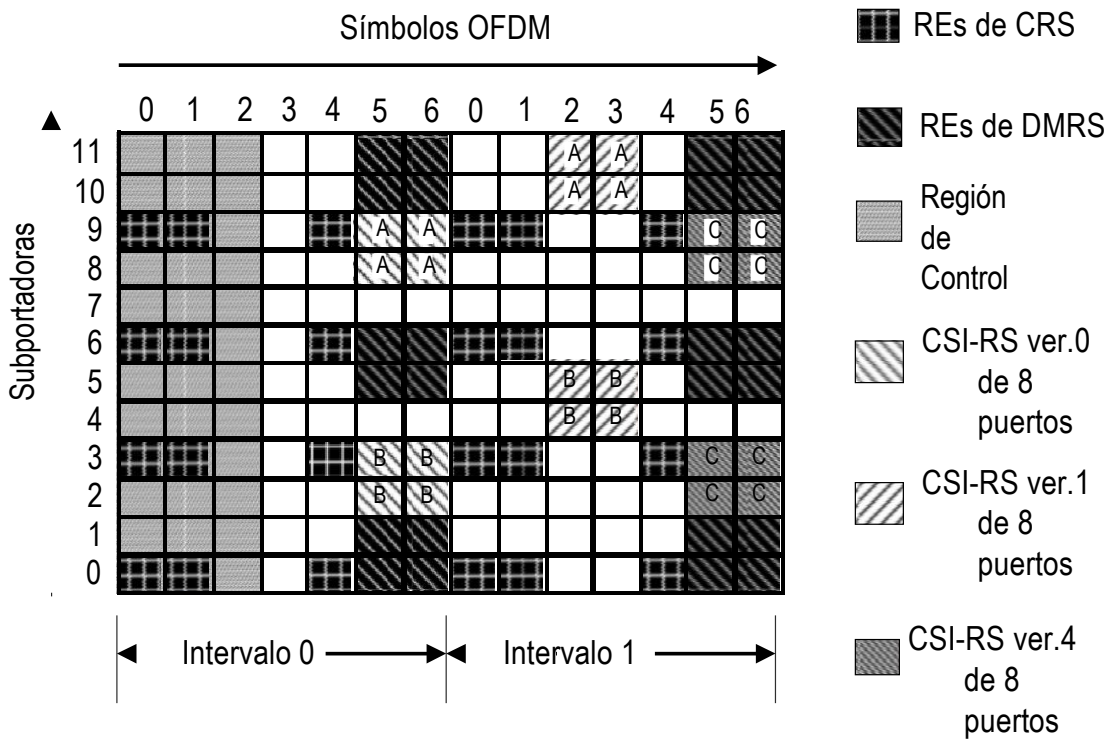
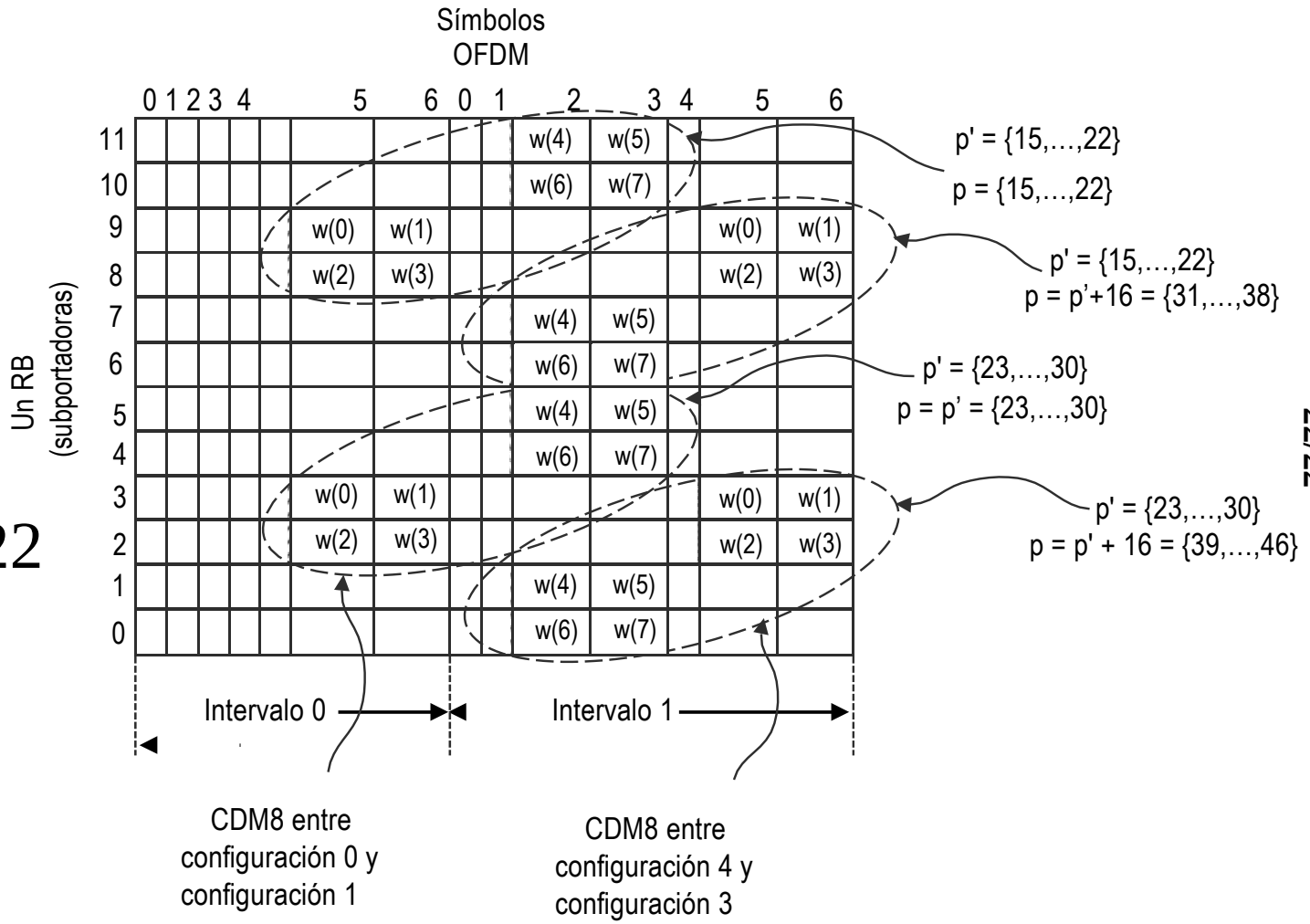

Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Subportadoras
11
10
9
8
7
6
5
4
3
2
1
0
A
B
C
Intervalo 0
Intervalo 1
REs de CRS
REs de DMRS
Región de Control
CSI-RS ver.0 de 8 puertos
CSI-RS ver.1 de 8 puertos
CSI-RS ver.4 de 8 puertos

Figura 20


Inicio
Recibir una configuración de agregación de CDM correspondiente a un primer conjunto y un segundo conjunto agregados de recursos de señal de referencia en un subcuadro
S104
Realizar la estimación del canal según la configuración de agregación de CDM
S106
Fin

Figura 21

Figura 22


Símbolos OFDM
0 1 2 3 4 5 6 0 1 2 3 4 5 6
Un RB (subportadoras)
11 10 9 8 7 6 5 4 3 2 1 0
w(0) w(1) w(2) w(3) w(4) w(5) w(6) w(7)
p' = {15,…,22}
p = {15,…,22}
p' = {15,…,22}
p = p'+16 = {31,…,38}
p' = {23,…,30}
p = p' = {23,…,30}
p' = {23,…,30}
p = p' + 16 = {39,…,46}
Intervalo 0
Intervalo 1
CDM8 entre configuración 0 y configuración 1
CDM8 entre configuración 4 y configuración 3
Configuración 0 de CSI-de 8 puertos
Configuración 1 de CSI-de 8 puertos
Configuración 3 de CSI-de 8 puertos
Configuración 4 de CSI-de 8 puertos