

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference EIE230339PCT		Date of mailing (day/month/year) 19 December 2023
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/CN2023/093882	International filing date (day/month/year) 12 May 2023	Priority date (day/month/year)
International Patent Classification (IPC) or both national classification and IPC H04W 72/231(2023.01)i		
Applicant NOKIA SHANGHAI BELL CO., LTD. et al.		

1. This opinion contains indications relating to the following items:

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|-------------------------------------|--------------|---|
| ☒ | Box No. I | Basis of the opinion |
| ☐ | Box No. II | Priority |
| ☐ | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| ☐ | Box No. IV | Lack of unity of invention |
| ☒ | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement |
| ☐ | Box No. VI | Certain documents cited |
| ☐ | Box No. VII | Certain defects in the international application |
| ☐ | Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/ CHINA NATIONAL INTELLECTUAL PROPERTY ADMINISTRATION 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088, China	Date of completion of this opinion 12 December 2023	Authorized officer LI,XiaoLi Telephone No. (+86) 010-53961772
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2023/093882

Box No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),
☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	4-14, 16, 21-25, 27	YES
	Claims	1-3, 15, 17-20, 26, 28-33	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-33	NO
Industrial applicability (IA)	Claims	1-33	YES
	Claims	None	NO

2. Citations and explanations:

D1: WO2017128800 (28.09.2018)

Novelty and Inventive step (PCT Article 33 (2) and (3))

D1 discloses a method of wireless communication (description, paragraphs [0058]-[0138]). For example, eNB 700 includes controller/processor 240 which controls the hardware and components, and executes the logic stored on memory 242 to implement the operational environment and features of eNB 700. UE 800 includes controller/processor 280 which controls the hardware and components, and executes the logic stored on memory 282 to implement the operational environment and features of UE 800. The blocks illustrated in FIG. 5A are executed by a base station, such as eNBs 105 and 700, while the blocks illustrated in FIG. 5B are executed by a UE, such as UEs 115 and 800. At block 500, a base station, such as eNB 700, signals configuration of a plurality of CSI-RS resources associated with a CSI process. At block 501, a UE, such as UE 800, receives an identification of the plurality of CSI-RS resources configured and associated with a CSI process. At block 502, the base station, such as eNB 700, selects a subset of the configured CSI-RS resources for activation. At block 503, a base station, such as eNB 700, transmits a configuration signal identifying the subset of CSI-RS resources selected for activation. At block 504, a UE, such as UE 800, receives the configuration signal identifying the subset of CSI-RS resources that are activated for CSI measurement and reporting. At block 505, a base station, such as eNB 700, transmits CSI-RS over the activated CSI-RS resources identified in the configuration signal. At block 506, a UE, such as UE 800, measures channel conditions associated with the subset of CSI-RS resources indicated as activated. At block 507, a UE, such as UE 800, reports the CSI based on the measured channel conditions. At block 508, a base station, such as eNB 700, receives the CSI report from one or more of the UEs served by eNB 700. As described with respect to FIGs. 5A and 5B, aspects of the present disclosure provide for signaling of activation/deactivation of CSI-RS resources. Activation/deactivation may be executed by means of media access control (MAC) control elements (CEs). For example, when transmitting and receiving the configuration signal in blocks 503 and 504, a MAC CE may be used to activate or deactivate one or more NZP CSI-RS resources as indicated by a K-bit long bitmap in the MAC CE. For example, at subframe 0, base station 601 transmits NZP CSI-RS for NZP CSI-RS resource #1. UE 602 measures the CSI-RS and reports the CSI for NZP CSI-RS #1 at subframe 4. Based on the periodicity of 5 ms for CSI-RS of NZP CSI-RS resource #1, which is signaled to UE 602 via higher layer signaling, base station 601 transmits another CSI-RS for NZP CSI-RS resource #1 at subframe 5 and also transmits an activation/deactivation MAC CE 600 to UE 602 in order to identify the next CSI-RS resource or resources that will be active. Activation/deactivation MAC CE 600 provides for NZP CSI-RS resource #1 to be deactivated and NZP CSI-RS resource #2 to be activated. Wherein the MAC control element includes a K-bit activation bitmap, where K represents a total number of the plurality of CSI-RS resources, wherein the K-bit activation bitmap identifies the each of the plurality of CSI-RS resources that are deactivated and the each of the plurality of CSI-RS resources of the subset of CSI-RS resources. The functional blocks and modules described herein may comprise processors, electronics devices, hardware devices, electronics components, logical circuits, memories, software codes, firmware codes, etc., or any combination thereof. The present disclosure comprises a first aspect, such as a non-transitory computer-readable medium having program code recorded thereon. D1 also discloses an apparatus configured for wireless communication, the apparatus comprising: at least one processor; and a memory coupled to the at least one processor, wherein the at least one processor is configured to perform the method.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2023/093882

Box No. V

**Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability;
citations and explanations supporting such statement**

The solutions of claims 1-3, 17-20 and 28-33 are disclosed by D1, therefore, the subject-matter of claims 1-3, 17-20 and 28-33 is not novel and does not involve an inventive step.

The additional features of the dependent claims 4-14, 16, 21-25 and 27 are not disclosed by D1 entirely. But the undisclosed additional features of claims 4-14, 16, 21-25 and 27 are common knowledge in the art. Therefore, the subject-matter of claim claims 4-14, 16, 21-25 and 27 is novel but does not involve an inventive step.

The additional features “a CSI-reference singal (RS) resource”, “a CSI-RS resource set” and “ a resource setting” of claims 15 and 26 are disclosed by D1, the other additional features of claims 15 and 26 are common knowledge. Therefore, the schemes of claims 15 and 26 only including these features and the cited claims are not novel, the subject-matter of claims 15 and 26 is not novel and does not involve an inventive step, but in other cases, the subject-matter of claims 15 and 26 is novel but does not involve an inventive step.

Industrial applicability

The inventions of claims 1-33 can find industrial applicability in the technical field of communication, and thus meet the requirements of PCT Article 33(4).