

G. Bremer, G. Reyes, S. Samuel and B. Scatuorchio, "Shopping assistant with interface for wheelchair users," *2011 IEEE 37th Annual Northeast Bioengineering Conference (NEBEC)*, Troy, NY, 2011, pp. 1-2.

doi: 10.1109/NEBEC.2011.5778550

Abstract: The current options for manual wheelchair shoppers do not adequately support the needs of those bound to their wheelchairs. Our device provides a robust solution for assisting shoppers with manual wheelchairs by giving them the freedom to remain in their own wheelchair while shopping. A battery-powered (two 12V batteries) device will effortlessly propel the user through the store by way of two 0.44 hp motors, while providing the user with over 14 cubic feet of storage space in a conveniently rotating basket. The cylindrical basket consists of four compartments that can be lined with normal shopping bags for easy transport of goods. The device will be thoroughly tested under every reasonably conceivable extreme to ensure its proper operation in the applicable environment, including but not limited to: the navigation of inclined wheelchair ramps, aisles, doorways and check-out stations with variable load schemes. This device will not only improve the quality of life for manual wheelchair users but will also offer a superior solution for supermarkets at a significantly lower cost than current devices on the market.

keywords: {handicapped aids;wheelchairs;aisle navigation;check-out station navigation;doorway navigation;inclined wheelchair ramp navigation;manual wheelchair;rotating basket;shopping assistant;storage space;wheelchair user interface;DC motors;Manuals;Permanent magnet motors;Standards;Torque;Vehicles;Wheelchairs},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5778550&isnumber=5778512>

C. C. Teng *et al.*, "National Data Buoy Center 1.8-meter Discus Buoy, Directional Wave System," *OCEANS 2007*, Vancouver, BC, 2007, pp. 1-9.

doi: 10.1109/OCEANS.2007.4449298

Abstract: Since year 2005, the national data buoy center (NDBC) has been developing, testing, evaluating and refining a pitch-roll-heave directional wave measuring system. It consists of a 1.8-meter-diameter isomer foam flotation ring in the center of which is placed a cylindrical battery and instrument compartment. A MicroStrainreg 3DM-GX1 motion sensor, located at the center of flotation, provides a stream of nine measurements subsampled at a rate of 2,048 samples in 1,200 seconds. The buoy transmits standard NDBC directional wave spectral information each hour via an iridiumreg satellite modem after computing directional wave spectra from triaxial components of earth magnetic flux density and angular rate, and along-mast acceleration. Additionally, high-resolution data are stored onboard the station for post-deployment analysis. Testing has been done in seven steps. First, static testing of the 3DM-GX1 revealed that the measurement mode of the sensor yields varying amounts of electronic and processor noise. The best mode and time constants for the sensor were determined in the second step of development, using a desktop wave simulator designed exclusively for that purpose. It provided precisely known simulated directional wave information. In the third step, the complete buoy payload, including an air-depolarized, alkaline battery pack manufactured by cegasa International was placed on the one-meter radius NDBC directional wave simulator, with which a full end-to-end test was conducted. Fourth, after sufficient laboratory testing, the complete system was deployed near NDBC station 42007 in the northern Gulf of Mexico for several days, and there was found close agreement between measurements from the two platforms. Additional, as a fifth step, a second 1.8-m buoy with a different battery pack, consisting of 700 alkaline D-cells, was evaluated and found to be adequate, yet the batteries interfered with magnetometer measurements more than the smaller, lighter cegasareg batte- y pack. In the sixth step, the buoy with cegasa batteries was deployed in shallow water at the U.S. Army Corps of Engineers Field Research Facility, Duck, North Carolina, from December 2006 until April 2007. This deployment provided two sources of accurate directional wave data as a basis for comparison, the FRF 8-meter array of bottom-mounted pressure sensors and a datawell waveriderreg buoy. Comparisons indicated that the 1.8-m buoy gives excellent non-directional wave spectra and accurate wave directions. A small drawback, an area of on-going research, is that the buoy gives lower than desired spreading function values. It produces characteristically lower values than does the lighter, particle-following waverider buoy. Finally, NDBC deployed an identical, second 1.8-meter buoy off Mission Bay, California, next to another datawell waverider, from February to June 2007. Directional wave accuracy, using swell waves from a distant storm as ground truth, has proven to be excellent, although, as with the first deployment at Duck, directional spreading is less than desired. We speculate this is due to size and shape of hull and limitations arising from pitch-roll signal -to-noise ratio.

keywords: {ocean waves;oceanographic equipment;oceanographic techniques;AD 2005;AD 2006 12 to AD 2007 04;AD 2007 02 to 06;California;Duck;Gulf of Mexico;MicroStrain 3DM-GX1 motion sensor;Mission Bay;North Carolina;bottom mounted pressure sensors;datawell waverider buoy;directional wave simulator;directional wave spectra;directional wave system;discus buoy;distance 1.8 m;electronic noise;isomer foam flotation ring;magnetic flux density;pitch-roll-heave directional wave measuring system;processor noise;Battery charge measurement;Earth;Instruments;Magnetic flux density;Magnetic sensors;Modems;Motion measurement;Satellites;Sensor arrays;System testing},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4449298&isnumber=4449115>

A. R. Ruddle, J. Chen and Y. X. Teo, "Measurement of RF impedance for automotive 18650 cylindrical lithium ion cells," *2017 International Symposium on Electromagnetic Compatibility - EMC EUROPE*, Angers, 2017, pp. 1-6.

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Abstract: The impedance of sample 18650 format cylindrical lithium ion battery cells has been measured over the frequency range from 100 kHz to 200 MHz using a vector network analyser. The results indicate that these cells exhibit a small resistance and inductive reactance, both reaching around 2 Ω at 200 MHz, which do not vary significantly when generating a DC current.

keywords: {automobiles;battery powered vehicles;lithium;lithium compounds;network analysers;secondary cells;DC current;RF impedance measurement;automotive 18650 cylindrical lithium ion cells;battery cells;frequency 100.0 kHz to 200.0 MHz;inductive reactance;small resistance;vector network analyser;Batteries;Connectors;Electron tubes;Fixtures;Frequency measurement;Impedance;Impedance measurement;18650 cylindrical cell;automotive;battery;lithium ion;radiofrequency impedance},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8094812&isnumber=8094607>

J. S. Fodor, S. W. Gelb, L. J. Goldhammer and D. W. Moffett, "The design and performance of the Hughes HS-39C satellite solar arrays featuring large area solar cells," *IEEE Conference on Photovoltaic Specialists*, Kissimmee, FL, 1990, pp. 1188-1192 vol.2.

doi: 10.1109/PVSC.1990.111803

Abstract: The successful construction of the Hughes HS-393C solar arrays has demonstrated that large-area silicon solar cells are a viable design option for large space solar panels. The solar arrays used on the HS-393C satellite consist of two cylindrical solar panels. Each panel is approximately 12 ft in diameter and over 9 ft tall. The total array power is 1800 W at summer solstice after ten years in geosynchronous orbit. HS-393C is the first commercial satellite to utilize large-area (>6-cm×6-cm) silicon solar cells as the primary

power source. These cells offer a significant cost advantage over more conventionally sized solar cells ($<2 \times 6$ cm). Analysis after one year in orbit on the first HS-393C indicates that the arrays manufactured from these large-area cells are performing better than expected

keywords: {artificial satellites;elemental semiconductors;silicon;solar cell arrays;solar cells;space vehicle power plants;1.8 kW;12 ft;9 ft;Hughes HS-39C satellite;Si;arrays;cost;design;geosynchronous orbit;panels;performance;solar cells;space power;Aircraft manufacture;Batteries;Cables;Connectors;Costs;Fabrication;Manufacturing;Photovoltaic cells;Satellites;Switches},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=111803&isnumber=3355>