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GNSS positioning availability control under space weather hazards

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A problem of real-time GNSS user positioning availability control under geomagnetic storms, solar radio flares and other irregular impacts is considered. A new methodology of positioning availability control under irregular external impacts is offered. The positioning availability value is defined as a full probability of event when we get a personal GNSS user's required navigation parameters (RNP) taking in account the current Positioning Delusion of Precision (PDOP), ranging errors and positioning errors. On a basis of GNSS/LAAS network dataset we get current GNSS performance statistics, such as positioning error standard mean and standard deviation and a number of positioning failures within the observation period. The PDOP values are used in order to compute an ancillary alarm index of a probable sudden positioning deterioration under poor GNSS satellite vehicles (SV) geometry. The method can be recommended for some transportation applications which have strong RNP, such as aviation landing systems and automatic railroad traffic control.

Biography

Vladislav V Demyanov completed his PhD in Radio-physics from Irkutsk State University and graduated as a Doctor of Science in Radio-navigation from Siberian Federal University. He is a Professor of Irkutsk State Transport University and Senior Researcher of Institute of Solar and Terrestrial Physics (Siberian Branch of Russian Academy of Science). He worked as Invited Researcher in Shanghai Astronomic Observatory. He has published more than 50 papers in reputed journals, prepared 3 monographs and 2 chapters of monographs. The main research interests are GNSS performance under Space Weather hazards, GNSS remote sensing and GNSS for transport applications.

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