



EGNOS performance using L1/L5 dual frequency on the Algerian area

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EGNOS (European Geostationary Navigation Overlay Service) provides data for more accurate real time positioning with an integrity message that improves the existing services of the GPS system.

The objective of this present work is about the analysis of the EGNOS system for the civil aviation applications, using the SBAS Simulator 2 software developed by the European Space Agency (ESA). The main searched results concern the comparison between the availability and continuity of the system when using the single frequency (L1) in simple mode, and the double frequency (L1/L5).

For civil aviation applications, in the frame of the ICAO (International Civil Aviation Organisation) requirements, four scenarios were tested for setting up the optimal performances (availability and continuity) of the EGNOS system on Algeria. These four tests will assure, for all the localisation and landing approach, a sufficient accuracy on GNSS signals real time positioning and integrity availability.

The performance of the EGNOS system in Algeria is thus mainly evaluated in terms of precision positioning and integrity, through three parameters: the error of the navigation system, the protection level, and the vertical precision error of the ionospheric grid.

The new signals on L5 significantly improve the availability of the EGNOS system for aviation, and the obtained results show that the high level of performance reached by GPS positioning augmented by EGNOS, is provided by the double frequency (L1/L5) processing, and correspond to the APV1 and LPV 200 approaches. The horizontal and vertical availability for all the services is about 100% in all the area (20 to 35 ° in latitude) according to a better ionospheric modelisation by the bi-frequency mode.

Implementing facilities of an EGNOS RIMS (Ranging and Integrity Monitoring Station) ground station in the country, and the choice of an optimal site, will certainly offer several advantages, particularly in terms of accuracy, availability, integrity and reliability.

Key words: GNSS, EGNOS, Bifrequency, Positioning, Navigation, Aviation