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OPTIMAL POSITIONING ACCURACY FOR GLOBAL NAVIGATION SATELLITE SYSTEMS

Abstract

Global Positioning System (GPS), because of its superior stability, global coverage accuracy, and ease of use, in comparison to inertial measurement systems, is considered to be at the forefront of satellite navigation. Research presented analyzes different accuracy types possible with GPS pseudo-range code measurements and viable enhancements possible for enhancing GPS positioning accuracy. Under normal situations, it is possible to achieve an accuracy of 10 meters or better with GPS pseudo-range measurements. Although, a substantial drop in accuracy is observed in adverse geographic conditions like densely populated areas, or canyons. One way to enhance preciseness is the application of Differential GPS (DGPS). But, DGPS depends on active management and is not easily available throughout the planet. A solution presented in this research, to deal with such a problem, as an extension to the current GPS framework, is the utilization of pseudo-range measurements from the Galileo Global Navigation Satellite System for improving positioning accuracy. On the application of GPS in conjunction with Galileo GNSS, improvement in positioning accuracy is possible by at least a factor of 2.