

Development of a Precise Orbit Determination System for GPS

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The main objective of this research is to develop a precise orbit determination system for the Global Positioning System(GPS). To use dual frequency double differenced carrier phase measurements, the functions, structures and algorithms of the precise orbit determination techniques were investigated. The precision orbit determination system consists of dynamic models for the satellites, GPS measurement models, and parameters estimation filter. The functional and performance tests of the software were performed using weighted least square batch filter technique with the real data of International GPS Service(IGS). The GPS orbit determination results shows that the sub-meter level position accuracy can be achieved with the dual frequency GPS measurements. A further study is encouraged for this orbit determination system to be improved for space geodesy research at GDC(Global Data Center) of Korea Astronomy and Space Science Institute.

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