

Mobile Platform's Attitude Determination Based on Smoothed GPS Code Data and Carrier-Phase Measurements

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Abstract : Mobile platform's attitude estimation approaches mainly based on combined positioning techniques and developed algorithms; which aim to reach a fast and accurate solution. In this work, we describe the design and the implementation of an attitude determination (AD) process, using only measurements from GPS sensors. The major issue is based on smoothed GPS code data using Hatch filter and raw carrier-phase measurements integrated into attitude algorithm based on vectors measurement using least squares (LSQ) estimation method. GPS dataset from a static experiment is used to investigate the effectiveness of the presented approach and consequently to check the accuracy of the attitude estimation algorithm. Attitude results from GPS multi-antenna over short baselines are introduced and analyzed. The 3D accuracy of estimated attitude parameters using smoothed measurements is over 0.27° .

Keywords : attitude determination, GPS code data smoothing, hatch filter, carrier-phase measurements, least-squares attitude estimation

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