

Ambiguity Resolution and Clock Bias Estimation Applied to Satellite Relative Positioning and Attitude Determination

*S.-G. Lin*¹ *J. Wu*²

Abstract

In this paper we study the positioning technologies which have high efficiency and precision, therefore our objects of study include both rapid static positioning and kinematic positioning. We analyze the rapid static positioning by various baseline length from about 50m to 26km, and evaluate the kinematic positioning with respect to its repeatability and feasibility by a baseline of about 10km. These technologies are applied to satellite leveling and experimentally verified. For 25 check points in a 6km × 5km flat test area, the rapid static and kinematic satellite surveying technologies can yield ±1.1cm and ±1.3cm height accuracy. Besides, a technique of the decorrelation method to improve the accuracy by calibration the receiver clock bias is offered in this paper, and using Ashtech 3DF data to prove it. From experiment we know the height component is improved about 300%.

Keywords: Rapid static positioning, Kinematic positioning, Attitude determination.

¹ Associate Researcher, Precision Instrument Development Center, National Science Council

² Professor, Center for Space and Remote Sensing Research, National Central University