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Orbit Determination and Propagation (9)

Author: Dr. Johannes Herzog
Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany, johannes.herzog@dlr.de

Dr. Hauke Fiedler
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, hauke.fiedler@dlr.de

BI-STATIC OBSERVATIONS WITH SMARTNET(TM)

Abstract

In the process of initial orbit determination, the used observation arcs are short compared to the orbital period. Consequently, the determined orbital elements carry large uncertainties. The most crucial orbital elements in this sense are the semi-major axis and the eccentricity as they are defining the orbital period and observation intervals, respectively.

The problem of estimating the semi-major axis can be reduced when using simultaneous observations from two distinct stations with a large baseline. The observation geometry then allows to calculate a geocentric distance which may be used as an a-priori semi-major axis to schedule a first follow-up observation.

In this study, we will present observations obtained by the telescopes of SMARTnet^{TM}. Those are located in South Africa and Australia, respectively. We will show how accurate the estimated geocentric distance from observations of both stations will be with respect to the individual stations alone.