Determination of Relative Motion of Satellites in Geostationary Orbit using Astrometric Observations

Elvis Lacruz[1] - Daniel Casanova[2] - Eva Tresaco[2]
Carlos Abad[1] - Juan José Downes[1]
(1) Centro de Investigaciones de Astronomía , Mérida-Venezuela
(2) Centro Universitario de la Defensa Zaragoza *

May 12, 2016

Abstract

We present the preliminary determination of relative motion of objects located at the Geostationary ring by means of astrometric observations. Approximately 200 Gigabytes data were obtained from different observing campaigns carried out during the last three years. These data represent images of the real 2048×2048 pixels that were acquired with a 1-meter reflector telescope located at the Observatorio Astronómico Nacional, Mérida (Venezuela). The field of view of these images is $\alpha \in [8°, 117°]$ and $\delta \in [-2°, 2°]$.

An ad hoc algorithm has been developed to automatically compute the geocentric coordinates of the acquired data. In this work, we show the detection and tracking of two geostationary satellites placed at 77° W longitude along with their relative trajectory during the observational period. Then, we will compute the orbital elements of the objects using orbit determination routines. Finally, we intend to apply the methodology proposed to the case of space debris objects.

*elvis@cida.gob.ve, http://www.cida.gob.ve