

Non-gravitational Perturbation acting on ASTRO-G

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Because of large area-to-mass ratio (~ 0.05), the orbit of ASTRO-G is strongly influenced by non-gravitational perturbations. In this work, the effect of atmospheric drag, solar and earth radiation pressure acting on the orbit of ASTRO-G has been investigated.

To compute acceleration due to atmospheric drag, two different upper atmosphere density models, namely DTM-94 and NRL-MSISE00, were compared. Changes in cross section

due to attitude change of the satellite and rotation of solar array paddle were also taken into account.

Moreover, a new computing method of solar and earth radiation pressure using Graphics Processing Unit attached onto the graphic card as a highly multithreaded co-processor has been developed. This method enables us to reduce the computation time for calculating radiation pressure acting on the satellite with complex shape.