

The Laser Pressure Perturbation on the Spacecraft's Orbit.

M. El-Saftawy

National Research Institute of Astronomy & Geophysics-Cairo, Egypt (m_el@nriag.sci.eg / +202 5548020)

The aim of this work is to study the laser power which can disturb the satellite's orbit. The Components of the force due laser pressure in the direction of the position vector "R", the transverse component in the orbital plane "T and the normal to the orbital plane "W" is introduced. The disturbing function of the photon's pressure on the satellite's surface in terms of orbital elements and the physical parameters of the laser beam are analyzed. Numerical applications, using Helwan SLR station for measuring the range and station coordinates, is applied for the spacecraft TOPEX to explain the effect of the laser on the components of the spacecraft acceleration.