

Optical Response Simulation of Corner Cube Reflectors for SELENE2 Mission

Shingo Kashima^{1*}, Hideo Hanada¹, Hiroshi Araki¹, Hiroto Noda¹, Hiroo Kunimori²

¹RISE Project, NAOJ, ²National Institute of Information and Communications Technology

The object of these simulations is clearing up the criterion for the Corner Cube Prism (CCP) and the Corner Cube Mirror (CCM) in order to measuring the distance from the Earth to the Moon in cm order. In case of the CCP, the refractive index inhomogeneity restricts its size to small (~10cm), so we did not calculate the effect of any deformation. In case of the CCM, we calculated both effects of the Moon gravity deformation and the thermal deformation.

The Optical responses were calculated with CodeV (Synopsis, Inc.), and we did not consider DAO (Dihedral Angle Offset), because the common optical simulation software cannot calculate its effect.

The Optical response criterion is that the encircled energy within 3.5mrad (half angle) > 50%, where 3.5mrad is equal to the minimum deflection by the velocity aberration without DAO. The velocity aberration deflect 3.5-7mrad from the Laser emitted direction according to the relative speed between the Earth and the Moon.

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