

SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (4)

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UTILIZATION OF GEOSTATIONARY OR HIGHER ORBITS FOR ASTEROID MONITORING AND
COLLISION MITIGATION MISSIONS**Abstract**

Potentially hazardous asteroids (PHAs) have recently attracted interest for their potential threats whose ramification ranges from regional to global. At the same time, the mission goals of robotic space probes, previously limited to flying by or rendezvousing with asteroids, are now advancing toward sample returns, following the Hayabusa explorer's success. However, high-accuracy physical characterization or deflection technology demonstration is still far from being applicable to a large population of PHAs. Missions in geostationary or higher orbits may provide an ideal alternative, where low-cost experiments can be conducted to characterize or mitigate the hazards of PHAs. In these orbits, close approaches of asteroids are better observed than on the ground or low-Earth orbits. Kinetic energy impacts are also demonstrable by colliding parts of nonfunctional satellites in the "graveyard" orbits with an asteroid at high velocities, which greatly saves the launch cost of such missions. Along with the proposed concepts, this paper discusses options to implement these missions with current space assets such as hosted payloads or dispensed payloads on commercial satellites in geostationary Earth orbits.