

Exploration of Near Earth Asteroids (06)  
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## A MISSION PLANNING TOOL FOR EXPLORATION MISSIONS

**Abstract**

Exploration Mission Planners are currently examining a large number of destinations for future exploration missions, including habitats in cis-lunar space, a variety of locations on the lunar surface, near earth asteroids (NEA), and the moons and surface of Mars. And the number of potential destinations is continuing to grow as additional NEA's are discovered. In this paper we describe a round trip mission calculator that we developed to rapidly analyze and select candidate NEA encounter opportunities in the 2018 to 2040 time frame. This tool uses available presorted data, or JPL's Small Body Data Base to identify closest approach opportunities and calculate round trip times and departure and arrival velocities at earth and the NEA. We describe the assumptions that we made to preselect the candidate NEA's for a typical analysis, the results from our Linear Model (Clohessy Wiltshire) Round Trip Mission Calculator, and our conclusions regarding the sensitivity of the number of NEA mission opportunities per year to the in-space delta-V capability of the space vehicle.