

Abstract Submitted  
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**Evaluation of Low-Thrust Propulsion Options for Cargo Missions to Near-Earth Objects**<sup>1</sup> MICAH SPAUN, KAMESH SANKARAN, Whitworth University, WHITWORTH UNIVERSITY TEAM — A simple method developed to optimize low-thrust trajectories to near-Earth objects is presented. A computational tool developed using this method was tested for a round-trip cargo mission carrying a payload of 1000-2000 kg to the asteroid 1996XB27. Several existing electric thrusters (a Bi Hall thruster at two levels of operation, a Xe Hall thruster, an applied field Li Lorentz force accelerator, the HiPEP ion thruster and the VASIMR) were considered for this mission, at their demonstrated values of performance parameters, to examine the validity of this new computational tool. In the range of power levels considered (150 to 600 kW), increasing the power level had only a small effect on reducing the trip time. It was found that a Bi Hall thruster operating at a high thrust-to-power ratio allowed for the shortest trip time, and a Bi Hall thruster and the HiPEP ion thruster with very high values of exhaust velocity and efficiency required the least initial mass to transport the payload. It was found that this new tool yielded results that were realistic, and insights from the results for thruster development are discussed.

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Kamesh Sankaran  
Whitworth University

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