

Abstract Submitted  
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**Evaluation of Electric Propulsion Systems for Asteroid Sample-Return Missions<sup>1</sup>** ANDREW FRENCH, SARAH GADY, ANSH SEHGAL, Whitworth University — This study evaluated the suitability of eight existing ion and Hall thrusters to meet some of the key requirements of sample-return missions to near Earth asteroids. The OSIRIS-REx mission was used as a baseline for evaluation, and all thrusters were expected to transport a dry mass of at least 750 kg to the asteroid 1999RQ36, land on it in 2019 and stay for an extended period, and return with a sample of the asteroid to Earth. Then, the values of the dry mass to be transported, required stay time on the target, and the mass of the sample to be returned were considered as parameters to be varied. The thrusters were evaluated for this mission at their measured performance levels, and their suitability was evaluated for various values of the specific mass of the power plant. The spacecraft was allowed to coast without thrust at appropriate places in its trajectory to reduce fuel consumption. The resulting values of total trip time and wet mass at LEO for the various cases are presented and are compared with the baseline case of the OSIRIS-REx mission.

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