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MOBIUS: A CISLUNAR CYCLER IN A MULTI-BODY PROBLEM SCENARIO

Abstract

The MOBIUS Cycler concept presents a novel methodology for future lunar missions. A quartet of spacecraft is suggested to be used in specific supersynchronous orbits, patched with other trajectories, for a cislunar, cycling vehicle system in a multi-body problem scenario. Earth and lunar shuttlecraft will rendezvous with each cycler at Earth perigee and lunar proximal apogee of the selected supersynchronous orbit for crew exchange, and eventually lunar lander will transfer the crew from Lunar Transit Lounge (LTL) located at L1 libration point to the surface on a routine basis. Simulation results show that a minimal station keeping will be required to maintain the spacecraft in the orbit. The MOBIUS concept is modeled using state-of-the-art tools proving it to be optimal and proposes a viable strategy that attempts to make self-sustaining, continuous lunar missions a reality.