

SPACE SYSTEMS SYMPOSIUM (D1)
Space Systems Architectures (4)

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CAN THE USE OF SMALL LAUNCH VEHICLE TECHNOLOGY PROVIDE TIMELY ACCESS TO
NEAR EARTH OBJECTS?**Abstract**

Current research in Near-Earth Object (NEO) rendezvous missions is focused on long duration-minimum energy trajectories to minimize propulsion mass and maximize payload. However, there may exist NEOs that will not lend themselves to early detection, allowing for mission planning and execution exceeding one year or more. Such objects will require a time critical response that may not be achievable with medium and heavy lift launch vehicles and complex payloads.

This paper explores the use of small launch vehicle technology coupled with direct ascent to assess the capability of such a system, the expected mission time and considerations for system design improvements. Payload tailoring for specific functionality to minimize mass and complexity coupled with launch window and ascent trajectory design provide a measure of capability that would be suitable for cost conscious mission planning. Small launch vehicles can have a role in the exploration of near earth space when time to target is a major design driver.