

## **Mass Advantage of Titan Aerocapture**

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NASA's 2007 Titan Explorer study employed Titan aerocapture to place a spacecraft in orbit around Titan, while NASA's 2008 Titan / Saturn System Mission (TSSM) study enters Titan orbit propulsively. These two studies may be used to develop a comparison of the mass advantage of aerocapture vs. chemical propulsion to achieve Titan orbit.

This poster will present details of trajectories developed for the TSSM study and compare the dry mass achievable for Titan orbiters with these trajectories using both chemical propulsion and Titan aerocapture. Interplanetary trajectories using both chemical propulsion and solar-electric propulsion (SEP) will be used.

The mass advantage provided by aerocapture could be used to improve a future Titan mission by: delivering a larger science payload, delivering additional vehicles, using a smaller (and less expensive) launch vehicle, or by using a higher DV interplanetary trajectory to achieve faster flight times to Saturn.