Need for High TRL Alternate Entry Technologies

Rigid Aeroshell using Alternate TPS
- Alternate CP
- Woven TPS
- Flexible TPS

Alternate Architectures
- Aerocapture Entry
- Direct Lifting Entry
- Low and Mid L/D
- ADEPT
- HIAD
- SIAD
- Ballutes
- Asymmetric Capsule Vehicle (ACV)

Rigid Aeroshell using Heritage Carbon Phenolic (Tape Wrapped and Chop Molded)

11/14/12
POC: mina.cappuccio@nasa.gov
Need for High TRL Alternate Entry Technologies

- Planetary Sciences Decadal Survey (PSDS) identified a lander mission to Venus as a candidate mission concept for the next New Frontiers AO

- Risks identified with availability of Heritage Carbon Phenolic (HCP), G-Loads qualification of instruments, and environmental testing needed to qualify various components for mission success

- Tasked by ISPT – EVT to perform study to define capabilities requirements for enabling missions to Venus and Saturn given that the heritage technology is no longer available.

- Analysis performed to understand design space/constraints for using HCP on rigid aeroshell, defined performance requirements for alternative (mid density) TPS, and identified limits on trajectory space in order to use existing TPS for a Venus lander, based on Decadal Study (VISE)

- Compared ballistic entry of a rigid aeroshell with HCP against an aerocapture entry of a low L/D and mid L/D probe with PICA.

- Papers on methodology and results of trajectory analysis performed will be presented at IEEE in March and IPPW-10 in June. Data can be used to help define requirements and key performance parameters towards technology maturation.