SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 3 (3C)

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AN OPTIMAL SEPARATION POINT EVALUATION METHOD FOR SEPARABLE DEEP SPACE PROBES

Abstract

Deep space exploration mission usually requires large delta-v. Compare with integrated spacecraft, separable deep space probe can provide delta-v by relay of two levels of propulsion systems and achieves better maneuver and load ability. This paper uses the spacecraft in-orbit mass as an effective evaluation index and proposes an engineering-oriented optimal separation estimation method for deep space probe by modeling the relationship between the dry mass and delta-v of the two-level propulsion system. This paper uses the mars probe as an example and gives the optimal separation point in the proposed estimation system. The advantages and constraints of separable deep space probes are discussed as a reference for the design and manufacture of future Chinese deep space probes.