OPTIMAL CONTROL FOR HALO ORBIT MISSIONS

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This paper addresses the computation of the required trajectory correction maneuvers (TCM) for a halo orbit space mission to compensate for the launch velocity errors introduced by inaccuracies of the launch vehicle. By combiningdynamical systems theory with optimal control techniques, we produce a portrait of the complex landscape of the trajectory design space. This approach enables parametric studies not available to mission designers a few years ago, such as how the magnitude of the errors and the timing of the first TCM affect the correction $\triangle V$. The impetus for combining dynamical systems theory and optimal control in this problem arises from design issues for the Genesis Discovery mission being developed for NASA by the Jet Propulsion Laboratory.