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## ⚙️ Enhanced Pseudo-Waypoint Guidance for Spacecraft Maneuvers

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An enhanced version of the scheme reported in "Pseudo-Waypoint Guidance for Proximity Spacecraft Maneuvers" (NPO-42753), *NASA Tech Briefs*, Vol. 31, No. 6 (June 2007), page 73 was developed. To recapitulate: the scheme provides algorithms for guidance and control (G&C) of a spacecraft maneuvering near a small astronomical body. The open-loop guidance problem is solved in advance or in real time by use of the pseudo-waypoint generation (PWG) method. Feedback control is implemented to track PWG tra-

jectories, in a manner that enables updating of G&C in a model-predictive manner. The scheme includes silent periods following each thruster firing.

The original version of the scheme provides for a fire-first, followed-by-silence sequence, which is disadvantageous in that the silence after final firing precludes reduction of any remaining velocity error — an unacceptable result in the case of a maneuver for which a specific final velocity is required. In the enhanced version, the scheme is augmented with a fire-second

technique, so that the final velocity can be established with a much higher precision because both the guidance and feedback firing can be performed and ceased at the final maneuver time.

*This work was done by John Carson and Behçet Açıkmese of Caltech for NASA's Jet Propulsion Laboratory.*

*The software used in this innovation is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-44276.*