Attitude Determination and Launch Diagnostics for a Picosat via Kalman Filtering of Magnetometer Data

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The picosat is a hockey puck sized spinning spacecraft with a two-axis ring core fluxgate magnetometer. The purpose of the picosat project is to demonstrate the technologies required to take simultaneous spatially distributed measurements of fields and particles with very small spacecraft. The on-board magnetometer supports this purpose by validating the field measurement objective, and by providing attitude dynamics information for use in evaluating the launch mechanism/procedure.

The paper presents methods developed for picosat attitude determination and dynamic modeling using data from the two-axis fluxgate magnetometer. Several picosat launch anomaly scenarios will be characterized to facilitate evaluation of the on-orbit performance of the launch system.

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