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Nuclear Magnetic Resonance Gyroscope MICHAEL LARSEN, MICHAEL BULATOWICZ, PHILIP CLARK, ROBERT GRIFFITH, JAMES MIRIJANIAN, JAMES PAVELL, Northrop Grumman — The Nuclear Magnetic Resonance Gyroscope (NMRG) is being developed by the Northrop Grumman Corporation (NGC). Cold and hot atom interferometer based gyroscopes have suffered from Size, Weight, and Power (SWaP) challenges and limits in bandwidth, scale factor stability, dead time, high rotation rate, vibration, and acceleration. NMRG utilizes the fixed precession rate of a nuclear spin in a constant magnetic field as a reference for determining rotation, providing continuous measurement, high bandwidth, stable scale factor, high rotation rate measurement, and low sensitivity to vibration and acceleration in a low SWaP package. The sensitivity to vibration has been partially tested and demonstrates no measured sensitivity within error bars. Real time closed loop implementation of the sensor significantly decreases environmental and systematic sensitivities and supports a compact and low power digital signal processing and control system. Therefore, the NMRG technology holds great promise for navigation grade performance in a low cost SWaP package. The poster will describe the history, operation, and design of the NMRG. General performance results will also be presented along with recent vibration test results.

Michael Larsen
Northrop Grumman

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