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Compact Atomic Magnetometer for Global Navigation (NAV-CAM) MICHAEL BULATOWICZ, MICHAEL LARSEN, Northrop Grumman Electronic Sy — Northrop Grumman Navigation Systems Division is developing an atom-based magnetometer technology that has the potential for providing a global position reference independent of GPS. The NAV-CAM sensor is a direct outgrowth of the Nuclear Magnetic Resonance Gyro under development by the same technical team. It will be the only known magnetic field sensor capable of providing all 3 axes of magnetic vector direction and magnitude simultaneously with a whole-field scalar measurement, all within a single multi-axis sensing element measuring 4mm cube or smaller, essentially eliminating many of the problems encountered when using physically separate sensors or sensing elements. According to information presented by Ariyur et al at the 2010 American Control Conference [1], the anticipated accuracy of 10 pico-Tesla (pT) and precision of <0.5 pT of the NAV-CAM sensor will enable magnetic determination of position with 20 meter accuracy and 1 meter resolution.

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