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Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction.-Instrumentation and data acquisition system -- Data processing -- ADCP Processing -- At-sea experiment of data acquisition system.
Sommario/riassunto	Dead-Reckoning aided with Doppler velocity measurement has been the most common method for underwater navigation for small vehicles. Unfortunately DR requires frequent position recalibrations and underwater vehicle navigation systems are limited to periodic position update when they surface. Finally standard Global Positioning System (GPS) receivers are unable to provide the rate or precision required when used on a small vessel. To overcome this, a low cost high rate motion measurement system for an Unmanned Surface Vehicle (USV) with underwater and oceanographic purposes is proposed. The proposed onboard system for the USV consists of an Inertial Measurement Unit (IMU) with accelerometers and rate gyros, a GPS receiver, a flux-gate compass, a roll and tilt sensor and an ADCP. Interfacing all the sensors proved rather challenging because of their different characteristics. The proposed data fusion technique integrates the sensors and develops an embeddable software package, using real time data fusion methods, for a USV to aid in navigation and control as

well as controlling an onboard Acoustic Doppler Current Profiler (ADCP). While ADCPs non-intrusively measure water flow, the vessel motion needs to be removed to analyze the data and the system developed provides the motion measurements and processing to accomplish this task.
