

**Title: INS-GNSS Integration Based on MEMS Technology**

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***Abstract***

The quality of GPS and combined GPS/Glonass systems as reference systems for DP operations has been improved through a long and incremental development cycle. Accuracy, availability and integrity have reached a level that was unthinkable some years ago. Even if this development will continue for many years to come, there are some physical limitations and common mode effects that will make barriers to further progress. Sensor hybridization is regarded as a promising approach to address these topics. Different methods for combining GPS and inertial sensors have been around from the early days of GPS when lack of satellite coverage was the main limiting factor. However, these solutions were never able to be a success as reference systems for DP operations due to factors like cost, limited sensor life time and some operational constraints. Over the last years there has been a sustained development of new sensor clusters based on MEMS gyros that in combination with novel approaches to sensor hybridization seems to have potential to overcome these limiting factors. This development is especially important considering that ionospheric activity is assumed to increase over the next 5-6 years causing occasional degradation of quality of GPS and Glonass signals. The paper outlines improvements of applied MEMS gyro technology addressing achievements in hybridization with advanced GPS technology. Initial results from a test program demonstrating some of the potential of such solutions for DP reference systems are included.

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