Live Site Demonstration of Advanced Geolocation Technology to Support Classification Level EMI Data Collect in GPS-challenged Areas

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Figure 1. EMI and AGT test sensor platforms.

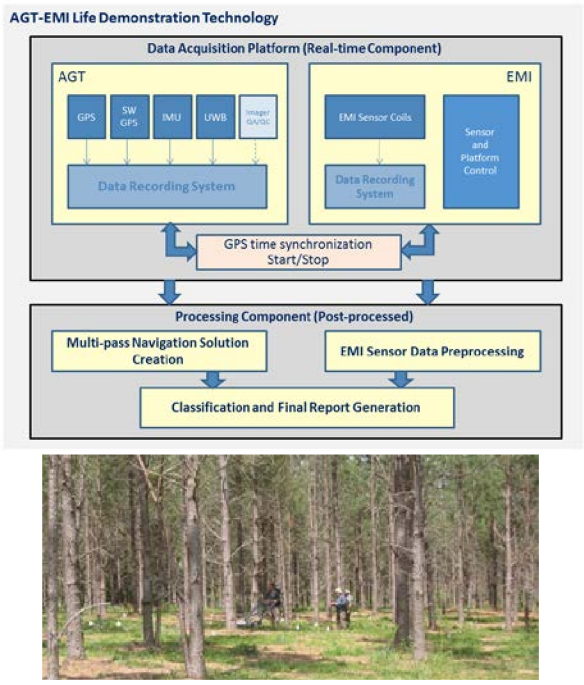

Figure 2. Technology configuration and typical application area.

The main objectives are (1) to demonstrate the acquisition of accurate six-degree-of-freedom platform navigation data (postprocessed geolocation solution) for an advanced EMI (Electro-Magnetic Induction) sensor array in open areas, and the resulting improvement in classification performance, realized with accurate platform attitude information, and (2) to provide accurate platform navigation data for the advanced EMI sensor in post-processed mode in GPS-challenged areas to support and improve the performance of the classification of buried objects. Since the advanced geolocation technology (AGT) always provides a full navigation solution, the availability of platform attitude data could potentially improve the classification outcome in this scenario.

The OSU AGT sensor suite includes core and auxiliary sensors, supported by data acquisition systems. The core sensors are GPS, IMU and local RF ranging (UWB). The GPS part consists of two sensors: a dual-frequency geodetic grade GPS receiver and a software GPS receiver, an RF frontend with a fast data logging system. In open areas, when strong GPS signal is available, the standard GPS receiver generally provides accurate positioning information, thus using software receiver may not be necessary. Note that the deep GPS/IMU integration model based on GPS software receiver is more computationally intensive, as compared to conventional GPS processing. In GPS-challenged areas, however, the software GPS receiver is the primary source of absolute positioning information, as traditional GPS solution is unavailable.