Location-finding technology has descended to a new level of low—beneath the earth’s surface, that is. AFRL sensors scientists participated in successful demonstration testing of subsurface navigation (SSN) technology, which provides navigational solutions for scenarios involving underground operations. Efforts to establish and advance SSN capabilities take specific aim at countering the inability of Global Positioning System devices to orient personnel or equipment in underground facilities, tunnels, building basements, or caves.

As the Defense Advanced Research Project Agency’s agent for SSN program work, AFRL collaborates with Raytheon UTD in developing geospatially based orientation technology that is as equally capable of leveraging existing signals of opportunity (SoOP) in the subsurface environment as it is in using active signal beacons deployed for a specific—perhaps supplemental—purpose. SoOP include natural signals (such as those emitted from lunar or solar gravity fields and geomagnetic noise), as well as man-made signals (such as those produced by communications satellites, radio and television broadcast towers, very-low-frequency communications and navigation transmitters, mobile telephone towers, and other sources not originally intended for SSN). When such signals are limited or nonexistent—or otherwise unsuitable for the particular underground mission or environment—active beacons deployed intentionally to replace or augment SoOP availability offer a reliable remedy.

In targeting the warfighter need for improved underground location and navigation utility, SSN research and development activity also seeks to address recognized military shortfalls in the area of assured positioning, navigation, and timing (PNT) in subsurface conditions, as cited in the PNT Joint Capabilities Document (dated 25 September 2006). The successful outcome of this demonstration test marks a significant milestone in advancing both the specific SSN capability and the general PNT mission.

For additional information on this technology contact AFRL/RY afrl.ry.marketing@wpafb.af.mil, (937)904-9771. To receive more information about AFRL, visit the Homepage at www.wpafb.af.mil/afrl. (RY-10-05_01-13)