

L-band STA Application Purpose of Operation & Test Area

Background:

This application relates to a specialized airborne L-Band radar remote sensing test application. The system, referred to as Polarimetric InSAR (PolInSAR), will be used in test mode to determine its effectiveness in measuring ground elevations (a Digital Terrain Model or DTM) beneath forest canopies of various type and condition. In order to gain understanding of system performance in various conditions, a number of test sites are planned (between 6 and 10) which represent different forest and terrain conditions. In particular, these conditions include different tree species, forest heights and densities, and terrain slope. There are certain constraints which limit the location of these test sites: (1) the temperature should be above freezing, but the system won't be available for test until late October-early November, so this precludes the north-eastern states, (2) there should be 'ground truth' available (e.g. lidar data) as well as other support data. The planning is underway, but incomplete regarding the exact locations of the test sites that fulfill these requirements and constraints. In the following we present the approximate locations of the proposed test areas along with other pertinent test parameters.

Test Parameters and Locations:

- Flight altitude: 3000' – 4000' AGL
- Typical Ground Speed: ~130 m/s or ~260 knots
- Ground swath: ~ 1km
- Typical number of flight lines per test site: 6 - 8
- Typical length of flight line: 25 km (unless several test sites may be found along a single flight path).
- Typical scenario: target area covered by partially overlapping swaths such that the same target area is illuminated successively by the radar beam at steeper and shallower viewing angles. A similar set of parallel overlapping swaths would be acquired from the opposite look direction. In some instances, orthogonal viewing directions will be acquired.

Potential test site locations:

1. Washington State: King County (mixed forested area)
2. Washington State: Capitol Forest (UofW test forest about 130 km SW of King County test site)
3. N. Carolina: Specific areas TBD depending on factors noted above.
4. W. Virginia: Specific areas TBD depending on factors noted above.
5. Maryland: Specific areas TBD depending on factors noted above.
6. Mississippi: Specific areas TBD depending on factors noted above.
7. Florida: Specific areas TBD depending on factors noted above.