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Battelle is seeking a Special Temporary Authority to operate an experimental point-to-point communications link operating at millimeter-wave frequencies. The link uses optical components to generate and modulate millimeter waves and has the capability of transmitting 10 Gb/s on a 100 GHz carrier.

The system uses high gain Cassegrain antennas (53 dBi) at both the transmitter and receiver site. Transmitter power would be less than 10 mW. Experience with this system has shown that the highly directional antennas will generate a very narrow beam (0.34 degrees) which is nearly impossible to detect, unless the receiving antenna (with 53 dBi gain) is perfectly aligned. Therefore it is unlikely that the experimental system will interfere with existing millimeter-wave systems.

Test Site 1: Battelle's Columbus Campus, Roof of Building 4, Columbus, OH
We plan to operate the signal constantly for several months to study the impact of weather and temperature.

Test Site 2: Battelle's West Jefferson Facility, West Jefferson, OH
The tests would be conducted on Battelle-owned land in West Jefferson Ohio. Figure 2 shows two configurations for the field test.

Scope:

The scope of project is an investigation of photonic approaches to provide high data rate wireless transmission on a millimeter-wave carrier. The proposed study includes validation of a 10 Gb/s bidirectional link at distances up to 1 mile.

Bandwidth:

From FCC table (g) under 47CFR2.202, the experimental system most applies to "Double-sideband radio relay system" in which the Necessary Bandwidth is defined by $B_n = 2M$ where $M = 5$ GHz. Therefore, the Necessary Bandwidth is $B_n = 10$ GHz.





Figure 1. Map of Field Test Site 1. This site is located at Battelle's Columbus Ohio campus.

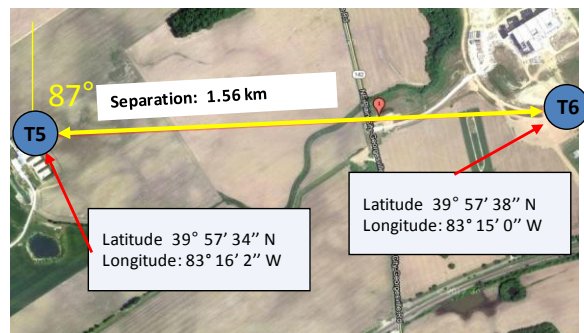
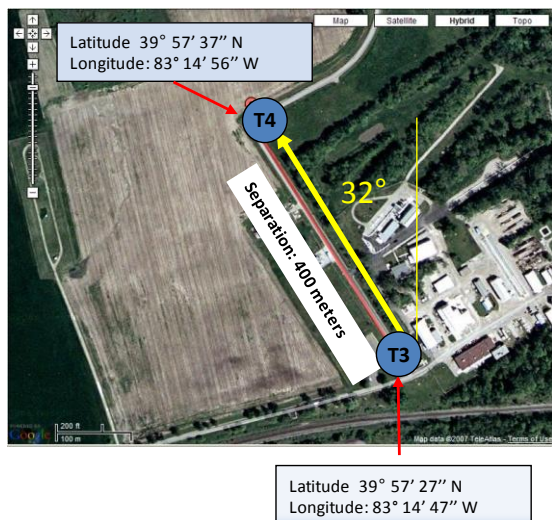


Figure 2. Map of Field Test Site 2. All sites are located on Battelle-owned land at its West Jefferson Ohio facility.