A Modular Profiling Network: From the Boundary Layer to the Tropopause

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EOL is developing a new system known as the Modular Profiling Network (MPN) to provide improved capability and flexibility for profiling the atmosphere. A center-piece of MPN is a modular wind profiler, made up of panels that can be assembled together to produce radars that can be scaled to suit multiple applications. For example, the modules could be deployed as multiple small radars to study the boundary layer over an extended area. Alternatively, the modules could be combined together to create a larger radar capable of probing higher into the atmosphere. The new wind profiler operates at 449 MHz, and features a low side-lobe antenna design, scalable electronics and advanced signal processing methods. A prototype 3-module boundary layer system has already been developed and a larger 7-module system, capable of reaching the mid-troposphere will be tested this summer. Ultimately at least 19 modules are proposed, which would allow six (3-module) boundary layer profilers, or two (7-module) mid-troposphere profilers, or one (19-module) full troposphere profiler to be deployed. The new system would be deployed with lidars and other sensors and is intended to meet the diverse needs for the studies of the surface layer, boundary layer, free troposphere, and tropopause, and thus support a broad range of meteorological and climate research.