

A Portable Lower-Tropospheric 449-MHz Radar Wind Profiler

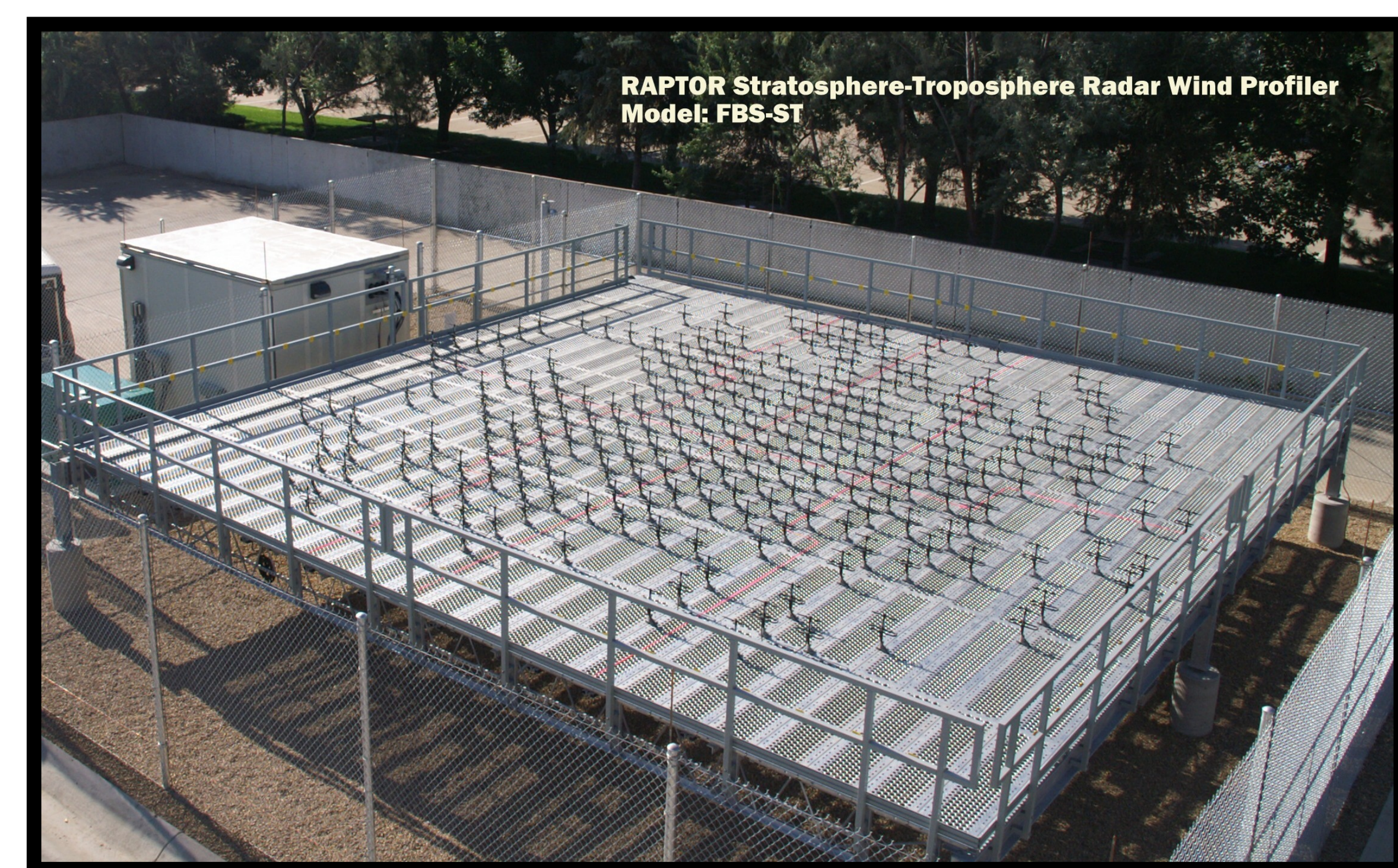
ABSTRACT

A new lower-tropospheric 449-MHz radar wind profiler (RWP) has been developed, which can be installed permanently (at a fixed site), or for portable use (on a trailer). The **RAPTOR XBS-T** uses Yagi antenna elements assembled and cabled at the factory so there is no assembly required for operation for mobile operations. Rather, for trailer operations, the 6-m diameter antenna array and ground plane fold to allow easy transport on a legal-width trailer. For pointing, the antenna is controlled by solid-state phase shifters that allow for 7-beam pointing (6-oblique and 1-vertical) and maintenance-free operations. The antenna is similar to that developed for the NOAA Profiler Network (NGNPN), but is approximately one-quarter the size. The new system architecture is described and data presented.



System Features & Components

- 'No-maintenance' solid-state beam steering unit with Yagi antenna array
- Easily adaptable for permanent or portable configurations
- Very quick setup and teardown time (< 60 min) in trailer configuration
- Full health and status monitoring for radar electronics and antenna
- Low sidelobe antenna with integral clutter fence
- 2-kW peak power, solid-state transmitter
- Wind profiles from 4 to 8 km or higher depending on location and season
- Dual simultaneous data outputs for high resolution (6 min) and hourly



Technology is similar to the scalable DeTect, Inc. "full-size" **RAPTOR FBS-ST** model designed for National Weather Service (NWS), which uses up to a 12-kW transmitter and 11m x 11m antenna, and is designed for 16+ km height coverage.

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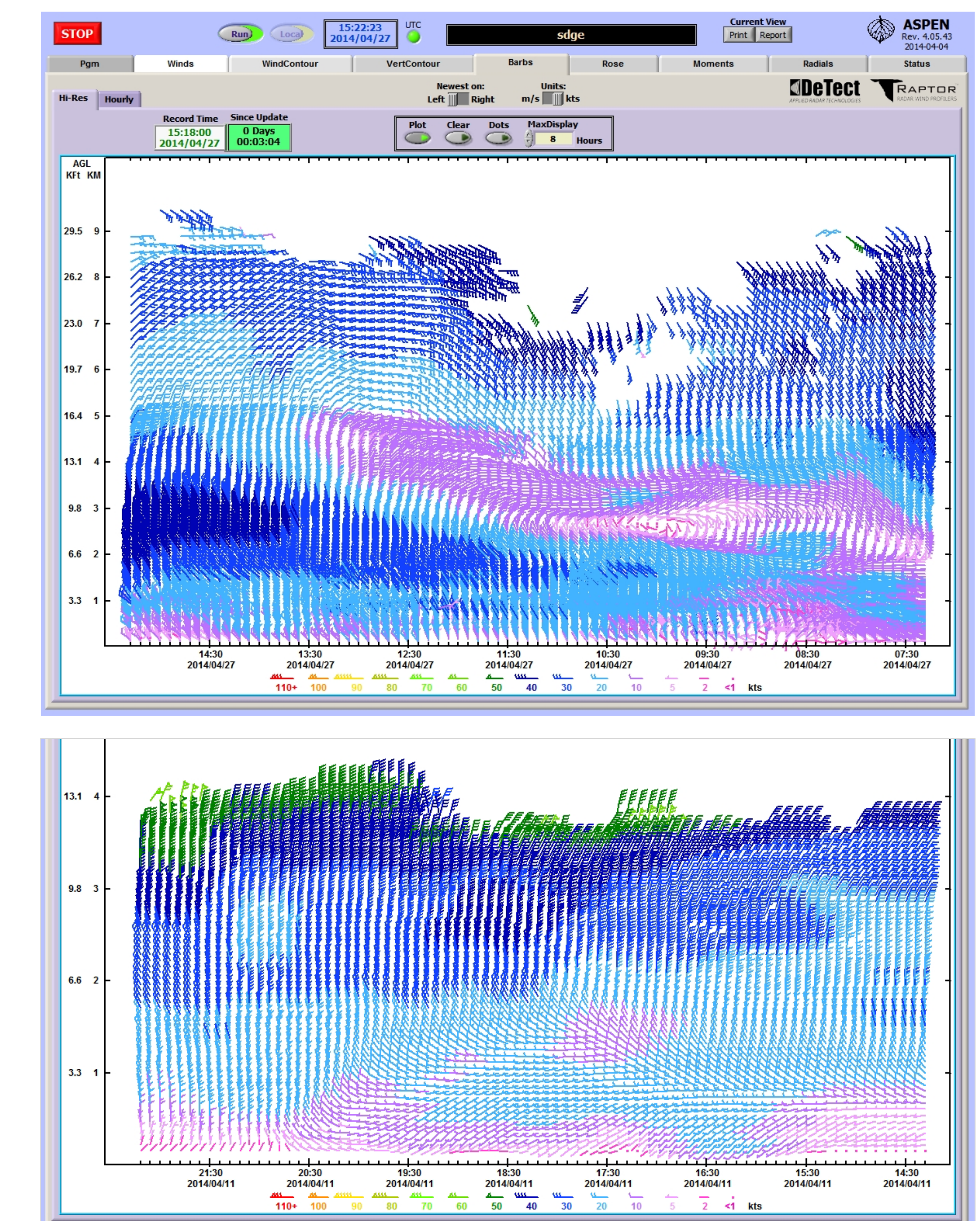
Web: <http://www.detect-inc.com/profiler.html>



Antenna easily folds for simple transport and quick setup. Trailer can be pulled with standard full-size pickup. After leveling, only two cables are required to connect and begin operation of antenna.



In mobile configuration, the electronics are shock-mounted in a 19" electronics rack on small trailer with air conditioning. Options include generator, cell-phone modem, met tower or integrated radiometer.



Wind data from XBS-T system. In mid-latitudes, for systems this size, data can range from a low of about 4 km in the winter to 8+ km and higher in the summer.



The **RAPTOR XBS-BL** is a "sister" system designed for boundary layer coverage, operating at 915 MHz or 1290 MHz. The 400-MHz band XBS-T (i.e., tropospheric) and 1-GHz band XBS-BL (i.e., boundary layer) share the same antenna pointing topology and other electronics. System is shown with integrated radiometer for humidity and temperature profiling.

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