

### **8.3 THE ADVANCED TECHNOLOGY DEMONSTRATOR AT THE NATIONAL SEVERE STORMS LABORATORY**

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The National Oceanic and Atmospheric Administration (NOAA) has identified evolutionary radar mission capabilities aimed at addressing current and future mission needs to support National Weather Service warning operations. Important requirements driving the next generation of weather surveillance radars include improvements in data quality, access to rapid-update volumetric data, and the ability to perform focused and tailored weather observations. Systems based on phased array antennas are promising solutions, and significant R&D investments over the last two decades have contributed to a growing understanding of this technology and to reduce risk associated with Phased Array Radar (PAR) technologies. Whereas many unique capabilities of PAR technology have been studied and even demonstrated, three main challenges remain: affordability, multifunction operation, and dual-polarization weather observations. As a major milestone in this quest, NOAA partnered with the Federal Aviation Administration (FAA) to develop the Advanced Technology Demonstrator (ATD). The ATD is a mid-scale, dual-polarized, multifunction, active, electronically scanned PAR that will be installed at the National Weather Radar Testbed in Norman, OK (USA). The ATD leverages several prior investments to provide a flexible and affordable radar system with which to evaluate performance and identify residual risk areas. The ATD proof-of-concept system is expected to provide important information about PAR polarimetric performance (including calibration), the maturity of this technology and its suitability to meet NWS mission-critical requirements, and the feasibility of having a single system supporting multiple missions. In this presentation we will provide an overview of the planned capabilities of the ATD, an update on progress to date, and a roadmap for engineering and meteorological research that will help prepare NOAA for the next generation of weather-surveillance radars.