

## 8.15 USING THE SPARC SIMULATOR TO REFINE AND JUSTIFY SENSR WEATHER SURVEILLANCE REQUIREMENTS

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The Spectrum Efficient National Surveillance Radar (SENSR) program seeks to replace the weather and aircraft surveillance capabilities of current, USA-government-owned, ground-based radar networks to enable 30 MHz of spectrum in the L band to be auctioned in 2024. A multi-agency study is being conducted to assess the feasibility of reallocating the capabilities of current L-band radars while addressing cross-agency mission needs. The Signal Processing and Radar Characteristics (SPARC) simulator is being utilized to help refine and justify, in terms of National Weather Service mission benefit, the SENSR weather radar surveillance requirements that will be provided to industry. The SPARC simulator ingests archived moment WSR-88D radar data fields to produce realistic time-series simulations that present a wide variety of weather events as if they were observed by radar systems with similar or inferior performance characteristics. SENSR requirements that are being studied include antenna and range sidelobe levels, azimuthal sampling, dwell time, and sensitivity. Weather events with mission-critical features are being gathered so that time-series data can be simulated to show the expected performance of radar systems with different characteristics. The radar data fields obtained from the simulated time-series data are then analyzed quantitatively and qualitatively to explore the impacts of relaxing some of the cost-driving requirements. This analysis includes looking at the effects of using a phased array antenna, since one possible candidate for meeting the demanding SENSR requirements is a multifunction phased-array radar (MPAR).