



NRAO Radio Spectrum Monitoring and Research Activities - 2023

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Over the past decade there has been significant growth in the use of radio spectrum in the microwave and millimeter wavelength regimes by commercial and government users. Passive services (e.g. radio astronomy, Earth observing) are slowly responding to new radio frequency interference (RFI) threats and challenges to their science missions, arising from constellations of communication satellites, and widespread deployment of cellular and wireless networks.

We will report on efforts at the National Radio Astronomy Observatory and Green Bank Observatory to detect, characterize and mitigate RFI impacts at our observing sites, including (a) preliminary results from a prototype Advanced Spectrum Monitor located at Green Bank; (b) results from a 1.5-year study of the impacts of SpaceX Starlink transmissions (satellites and user terminals) on the Very Large Array, indicating minimal interference; (c) our plans for real-time status coordination of our telescope control systems with satellite constellation managers to avoid RFI conflicts with observing programs.

Future scientific endeavors such as the next-generation Very Large Array^[1] will operate in a more complex and time-variable spectral environment than the current generation of radio telescopes have experienced, and an ability to accurately detect, characterize and effectively mitigate RFI is a critical part of any new telescope design. RFI mitigation plans for ngVLA will be discussed.

References

[1] ngVLA.nrao.edu