

# Wideband Frequency Reconfigurable Plasma Antenna Launched By Surface Wave Coupler

MANISHA JHA, NISHA PANGHAL, AJAY K. PANDEY, UNNATI PATEL, RAJESH KUMAR, SURYA K. PATHAK



Fig. Radiation Pattern measurement at Anechoic chamber

Plasma antenna is defined as an RF antenna which can be used for transmission and reception of electromagnetic signals instead of conventional metal antenna. Low RCS and reconfigurability properties of plasma antenna is an added advantage over its metal counterpart. We have successfully developed a low-power wideband reconfigurable plasma antenna, uniquely excited by a Surface Wave Coupler (SWC) operating at 13.56 MHz. Our research involved design and modeling of the plasma antenna and SWC using CST Microwave Studio, along with rigorous experimental measurements to validate their performance. In most of the traditional surface wave-driven plasma antennas, the excitation frequency typically aligns closely with the operational frequency, limiting the extent of reconfigurability. Our deliberate choice of an operating frequency higher than the excitation frequency is pivotal in achieving a wideband, reconfigurable plasma antenna. The study focuses on the detailed analysis of the SWC, including its power coupling as well as signal coupling and plasma antenna, using CST Microwave Studio, followed by the experimental characterization of the SWC and plasma antenna.