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Plasma Impedance Tomography for Imaging Plasma Dynamics¹ ERIK TEJERO, DAVE BLACKWELL, GEROGE GATLING, CHRIS CRABTREE, BILL AMATUCCI, United States Naval Research Laboratory — Plasma impedance probes measuring the self-impedance of the antenna-plasma system have been shown to provide accurate measurements of electron plasma density for space and laboratory plasmas. Plasma impedance probes measuring the mutual impedance between two antennas and a plasma dielectric have been successfully flown on sounding rockets and satellites. At the US Naval Research Laboratory, we have recently developed a novel plasma impedance tomography system consisting of an array of mutual impedance probes that uses the broadband impedance spectrum of the plasma to image electron density structures. The goal is to develop a system capable of providing tomographic reconstructions at a rate of a tenth of the peak plasma frequency of the system. Recent numerical and experimental results will be presented.

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