Abstract Submitted
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Microwave photonic bandgap devices with active plasma elements[1] BENJAMIN WANG, ROBERTO COLON QUINONES, DAVID BIGGS, THOMAS UNDERWOOD, ANDREA LUCCA FABRIS, MARK CAPPELLI, Stanford University, STANFORD PLASMA PHYSICS LABORATORY TEAM — A 3-D alumina rod based microwave photonic crystal device with integrated gaseous plasma elements is designed and characterized. Modulation of the plasma density of the active plasma elements is shown to allow for high fidelity modulation of the output signal of the photonic crystal device. Finite difference time domain (FDTD) simulations of the device are presented, and the functional effects of the plasma electron density, plasma collision frequency, and plasma dimensions are studied. Experimental characterization of the transmission of the device shows active tunability through adjustments of plasma parameters, including discharge current and plasma size. Additional photonic crystal structures with integrated plasma elements are explored.

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Benjamin Wang
Stanford University

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