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Gaseous Plasmonic Resonators for Metamaterial Applications¹ ROBERTO COLON QUINONES, THOMAS UNDERWOOD, MARK CAPPELLI, Stanford University — We examine the properties of a gaseous plasma resonator generated by focusing a high-energy laser pulse through a lens and into a gas. An analytical model is presented describing the scattering resonance of these nearellipsoidal plasmas and its dependence on their eccentricity and intrinsic plasma properties. This dependence is confirmed through Ku band transmission experiments of a waveguide with an embedded single plasma element and through optical diagnostics of the laser-induced plasma. The described resonator has the potential to be used as the building block in a new class of metamaterials with fully three-dimensional structural flexibility.

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