

Abstract Submitted
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Background Gas Species and Pressure Dependence of RF Emissions and Lengths of Laser Driven Filament Plasmas¹ ERIN THORNTON, Univ of North Texas, JAMES WYMER, TRAVIS GARRETT, JENNIFER ELLE, ADRIAN LUCERO, ANDREAS SCHMITT-SODY, Air Force Research Lab — The Air Force Research Lab seeks to understand the mechanism driving RF generation in laser driven plasma filaments. An 800 nm, terawatt class laser is used to propagate a plasma filament with various background gases under a range of pressures to study the RF emission from 1-13 GHz and the length changes of the filament. Air pressure has already been shown to have an inverse relationship with the amplitude of the microwave radiation emitted by the plasma, however this leaves more to be learned by studying individual gas species. Argon, helium, neon, nitrogen, and krypton are used to better understand the contributions of electron-neutral and electron-ion collisions to RF emission. Using a microwave horn with the ranges of 1-13 GHz and an S-band wave guide, the effects of the background gas species and pressure will be quantified and their relation to the RF emission and plasma length will be presented.

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