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Background gas species and pressure dependence of RF emissions generated by laser-produced filament plasmas ERIN THORNTON, University of North Texas, ALEXANDER ENGLESBE, JENNIFER ELLE, ADRIAN LUCERO, ANDREAS SCHMITT-SODY, Air Force Research Lab- Kirtland Air Force Base — The Air Force Research Lab is investigating RF emissions generated by ultra-short pulse lasers. 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 2-40 GHz of the filament. Air pressure has been previously shown to have an inverse relationship with the amplitude of the electric field wave form, however there is limited data with specific background gas species. Nitrogen, helium, argon, and krypton gases will be used to gain a better understanding the of contributions election-neutral and electron-ion collisions to RF emission or if the RF is independent of these factors. Using microwave horns that measure from 2-13 GHz and 13-40 GHz, the effects of the background gas species and pressure will be quantified and their relation to the RF emission will be presented.

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