Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

Single shot gas and weakly ionized plasma flow measurements with coherent Rayleigh-Brillouin scattering ALEXANDROS GERAKIS, Department of Aerospace Engineering, Texas AM University, MIKHAIL SHNEIDER, Department of Mechanical Aerospace Engineering, Princeton University — We suggest the use of single shot coherent Rayleigh-Brillouin scattering (CRBS) as a gas or weakly-ionized plasma flow and translational temperature measuring technique, applicable to both atomic and molecular gases, as well as gas mixtures. CRBS has already been demonstrated to be the coherent analogue of spontaneous Rayleigh-Brillouin scattering in measuring the temperature, pressure, bulk and shear viscosity, speed of sound and polarizability of a gas or gas mixture, in a single laser shot [1]. Preliminary estimates show that CRBS could detect gas flow velocities down to 10-20 ms-1 in a single laser shot, rendering it an ideal remote and non-intrusive diagnostic for aerospace applications, among other uses. We are currently working towards the application of single shot CRBS as a gas flow measurement technique and its use in neutral or weakly ionized gas flow environments. [1] A. Gerakis, M. N. Shneider, and P. F. Barker, "Single-shot coherent Rayleigh–Brillouin scattering using a chirped optical lattice," Opt. Lett. 38, 4449-4452 (2013)

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Date submitted: 19 Jun 2018 Electronic form version 1.4