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Turbulent Energy Analysis Behind Normal Ionizing Shock Waves[1] CHAVIS T. RAYNOR, JOSEPH A. JOHNSON, III, Florida A&M University, CEPAST — Using an Arc-Driven Shock Tube and Laser Induced Fluorescence, we measured the turbulent energy behind an ionizing shock wave in the presence of a weak axial magnetic field. Simultaneous density estimates were made from multiple points behind the flow. Two points measure density along the flow, while two additional points measure density across the flow. With the test gas held at constant pressure, it was determined that the turbulent energy increases linearly with increasing magnetic field strength. In contrast, the turbulent energy decreases with increasing pressure when the magnetic field is held constant. While the turbulent energy at the radial points are about the same, the strength of the turbulent energy at the axial points differ significantly from each other as well as from the radial points. This may be due to higher rates of radial diffusion towards the walls of the tube where recombination is greatest. In addition, the results of other turbulent parameters of interest will be discussed.

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