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Stationary Shock Wave Structures in a Microwave Flowing Afterglow D.J. DRAKE, J. UPADYAY, S. POPOVIC, L. VUSKOVIC, Department of Physics, Old Dominion University, Norfolk, VA 23529 — To understand the interaction between an acoustic shock wave and a weakly ionized gas, many experiments [1, 2] have been performed in recent years. There are several approaches where this interaction can manifest itself, such as the enhancement of optical radiation, plasma-induced shock dispersion and acceleration, shock wave induced double electric layer, and localized increase in electron temperature and density. Our experiments with acoustic shock waves and weakly ionized gases were performed in a supersonic microwave flowing afterglow in which was placed a model of generic geometry. Oblique shock parameters were evaluated exactly for the given geometry that was usually spherical. We observed an enhancement in the optical radiation across the shock layer, which coincided with the calculated standoff distance. We studied the stationary shock structure using the 4p excited state populations of argon, measured using absolute emission spectroscopy. Additionally, we studied the shock structure using higher energy states (4d, 6s). Interpretation of the results will be presented at conference.

[1] S. Popovic, L. Vuškovic, Phys. Plasmas **6** (1999) 1448.
[2] P. Bletzinger, B. N. Ganguly, A. Garscadden, Phys. Plasmas **7** (2000) 4341.

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