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**Structure of stationary shock waves in weakly ionized gas** D.J. DRAKE, B. RODGERS, S. POPOVIC, L. VUSKOVIC, Department of Physics, Old Dominion University — We performed detailed laboratory measurements of the excited-species population distributions across stationary shock waves in weakly ionized gas. Ionized gas was sustained in a cylindrical cavity integrated in the supersonic microwave flowing afterglow apparatus. An oblique solid body was suppressing the flow to generate a stationary acoustic shock wave. A cylindrical cavity was used to sustain a discharge in air, argon, and Martian air in the pressure range of 100-600 Pa. Argon is also a significant constituent of terrestrial and Martian air. Excited state populations of argon were measured using emission and absorption spectroscopy for the absolute intensities of the (4p-4s) spectral lines. Comparison was made between the populations in a model free flow and across the shock front. Oblique shock parameters were evaluated exactly for the given model geometry. Obtained data on the shock wave structure were compared with available shock-wave computational models.

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