TEMPERATURE MEASUREMENTS IN VOLUMETRIC MICROWAVE DISCHARGES [a]

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The microwave discharge has been proposed as an excitation source to create and maintain stable, large-volume low to moderate temperature plasmas at near atmospheric pressure. We study a microwave discharge produced from a variety of combinations of flowing Ar, CO and N_2. We concentrate on rotational temperature measurements based on spontaneous emission spectra from radicals such as C_2 and CN. Spectroscopic measurements are complimented by stability and uniformity measurements obtained by short exposure time-resolved images from an intensified CCD camera. The feasibility of using a microwave source for creating a large-volume plasma based on these temperature measurements, energy requirements, and basic plasma characterization will be reported.

[a] Research is primarily funded by AFOSR and DDRE under the Air Plasma Rampart MURI