

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 N₂. We concentrate on rotational temperature measurements based on spontaneous emission spectra from radicals such as C₂ 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.

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