Abstract Submitted for the TSS13 Meeting of The American Physical Society

Using Resonant Microwave Cavities for Material Properties JAMES ROBERTS, University of North Texas, JAI DAHIYA, S GHOSH, Southeast Missouri State University, JOINT COLLABORATION — The resonant microwave cavity is a very sensitive device operating very much like a high Q parallel RLC resonant network. In this paper we discuss some of the results obtained on plasmas, phase change in liquids and in gas-substrate interactions using microwave cavities. Results on the nature of the hydrogen bond will be discussed in the light of phase transition studies made on hydrogen and deuterium during phase transition from liquid to solid and solid to liquid. The macroscopic quantities frequency shift and width change at half-power-maxima of the resonance profile will be related to the microscopic quantities real and imaginary dielectric response of the material loading the resonant cavity. Slater's perturbation equations for perturbed resonant cavities will be used for analysis of the data. The apparatus used in this investigation is briefly discussed.

> James Roberts University of North Texas

Date submitted: 01 Mar 2013

Electronic form version 1.4