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Characterizing the Angular Frequency of Radiative Polaritons using Infrared Spectroscopy ANITA VINCENT-JOHNSON, GIOVANNA SCAREL, James Madison University Dept. of Physics and Astronomy — Polaritons are important for understanding the optical properties of oxide films and possibly also for energy conversion. The two known types of polaritons: surface phonon polaritons (SPP) and radiative polaritons (RP), form when infrared (IR) photons enter a crystal lattice material and couple with the phonons present. While SPP's are largely studied for their heat transfer properties, RP's are typically not studied; therefore, much is still not understood about RP's. It is known, however, that RP's have a complex angular frequency, which includes a real part, Re(ω), and an imaginary part, Im(ω). Investigations done by our Group suggests that Im(ω) indicates the frequency of the radiated field. What is unknown is the relationship between Re(ω) and Im(ω). Therefore, we experimentally compare three different oxides deposited on silicon and aluminum by atomic layer deposition (ALD). This allows us to characterize proportionality between Re(ω) and Im(ω) with respect to oxide film thickness.

Anita Vincent-Johnson
vincenaj@dukes.jmu.edu
James Madison University Dept. of Physics and Astronomy

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