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Measurement of the thermal effects in the dispersion relation of the dust acoustic wave[1] JOSHUA HOYNG, JEREMIAH WILLIAMS, Wittenberg University — A complex (dusty) plasma is a four-component plasma system composed of ions, electrons, neutral particles and charged microparticles. The charged microparticles interact with, and self- consistently modify, the surrounding plasma medium; resulting in a new and unique state of matter that can support a wide range of physical phenomena. Among these is a new wave mode known as the dust acoustic, or dust density, wave (DAW). The DAW is a low- frequency, longitudinal mode that propagates through the microparticle component of the dusty plasma system and is self-excited by the energy from the ions streaming through this component. Over the past twenty years, the dust acoustic wave has been a subject of intense study and recent studies have shown that thermal effects can, in some cases, have a significant role in the measured dispersion relation. A recent theoretical model suggest that the thermal effects are, in part, due to the finite size of the dusty plasma systems that support this wave mode. In this poster, we report the results of an experimental study examining this effect over a range of experimental conditions in a weakly-coupled dusty plasma system in an rf discharge plasma.

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