Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Optical spectroscopy of $\mathbf{K}_x\mathbf{Fe}_{2-y}\mathbf{Se}_{2-z}\mathbf{S}_z$ superconductors[1] CATALIN MARTIN, K. MILLER, University of Florida, Gainesville, FL 32611, HECHANG LEI, C. PETROVIC, Brookhaven National Laboratory, Upton, NY 11973, D. B. TANNER, University of Florida, Gainesville, FL 32611 — We measured the temperature dependent optical reflectivity $R(\omega)$ and extracted the complex optical conductivity $\sigma(\omega)$ of the $K_xFe_{2-y}Se_{2-z}S_z$ superconductors. At room temperature, both $R(\omega)$ and $\sigma_1(\omega)$ have semiconducting behavior. Upon cooling, at temperatures depending on the S-concentration, the low frequency reflectivity increases in absolute value and shows a sharp upturn, consistent with metallic behavior. The phonon spectrum of $\sigma_1(\omega)$, which is very different from similar Fe-based superconductors and also doping dependent will be explained in terms of the changes in occupancy of the Fe-sites with doping. An anomalous feature in optical reflectivity is observed in the superconducting state and its possible origin and association with the condensation of free carriers will be discussed.

[1]Supported by US DOE under contract DE-FG02-02ER45984 and under contract DE-AC02-98CH10886

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Date submitted: 10 Nov 2011 Electronic form version 1.4