Temperature-dependent phonon dispersions in URu$_2$Si$_2$ NICHOLAS BUTCH$^1$, JASON JEFFRIES, MICHAEL MANLEY, Lawrence Livermore National Laboratory, JEFFREY LYNN, NIST Center for Neutron Research, MARC JANOSCHEK$^2$, BRIAN MAPLE, University of California, San Diego — The acoustic and low-energy optical phonon modes of a single crystal of URu$_2$Si$_2$ were studied via inelastic neutron scattering. The temperature dependence of the phonon dispersions will be compared with results of prior studies of phonons in this material. Our measurements were also sensitive to the temperature evolution of magnetic excitations in the hidden order phase. We will reflect on implications for the nature of the hidden order parameter.

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Date submitted: 10 Nov 2011

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