

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Anomalous frequency dependent diamagnetism in metal silicide¹ ASHUTOSH DAHAL, JAGAT GUNASEKERA, University of Missouri, Columbia, MO, LELAND HARRIGER, NIST Center For Neutron Research, Gaithersburg, MD, DAVID J. SINGH, DEEPAK K. SINGH, University of Missouri, Columbia, MO, LELAND HARRIGER COLLABORATION — Discovery of superconductivity in PbO-type FeSe has generated a lot of interest. Among the samples we synthesize with similar structure, NiSi has showed anomalous but very interesting results. Nickel silicides are important electronic materials that have been used as contacts for field effect transistors, as interconnects and in nanoelectronic devices. The magnetic properties of NiSi are not well known, however. In this presentation, we report a highly unusual magnetic phenomenon in NiSi. The ac susceptibility measurements on NiSi reveal strong frequency dependence of static and dynamic susceptibilities that are primarily diamagnetic at room temperature. The static susceptibility is found to exhibit a strong frequency dependence of the diamagnetic response below 100K, while dynamic susceptibility showed peak type feature at 10KHz frequency around 50K. Detailed neutron scattering measurements on high quality powder sample of NiSi on SPINS cold spectrometer further revealed an inelastic peak around 1.5meV, even though no magnetic order is detected. The inelastic peak dissipates above 100K, which is where the static susceptibility starts to diverge with frequency.

¹Research is supported by U.S. Department of Energy, Office of Basic Energy Sciences under Grant No. DE-SC0014461.

Ashutosh Dahal
University of Missouri, Columbia, MO

Date submitted: 24 Nov 2015

Electronic form version 1.4