Evolution of superconductivity and magnetic order in LaRu$_3$Si$_2$
by rare earth and transition metal substitutions. RENXIONG WANG,
SHANTA R. SAHA, JOHNPIERRE PAGLIONE, Ceter for Nanophysics and Ad-
vanced Materials, Department of Physics, University of Maryland, College Park,
MD 20742, DANIEL PRATT, QINGZHEN HUANG, JEFFREY W. LYNN, NIST
Center for Neutron Research, Gaithersburg, MD 20899 — The recent discovery of
high temperature superconductivity in iron based materials has renewed interest to
condensed matter physics. Although its mechanism is not yet settled completely,
it should have a close relationship with the electron correlations. The compound
LaRu$_3$Si$_2$ shows superconductivity with a transition temperature $T_c = 7.8$ K. Recent
study indicates that electron correlations play a significant role for superconductivity
in this Kagome lattice of Ru and the Ru band dominates at the Fermi level, similar
to Fe-band in iron-superconductors. Superconductivity in LaRu$_3$Si$_2$ has been found
robust against the local paramagnetic moment. We will present our study on the
evolution of superconductivity and magnetic order in LaRu$_3$Si$_2$ due to substitutions
of Tm, a J=6 (J is the total angular momentum) ion with a maximum ordered mo-
ment of 7 $\mu_B$, and transition metals by measuring magnetic, transport and Neutron
scattering properties.

Renxiong Wang
Ceter for Nanophysics and Advanced Materials,
Dept of Physics, University of Maryland, College Park, MD 20742

Date submitted: 14 Nov 2012

Electronic form version 1.4