Abstract Submitted
for the TSF07 Meeting of
The American Physical Society

NMR measurements of $Al_{20}V_2La$ and $Al_{20}V_2Eu$[1] HAOYU QIAN, JI CHI, SERGIO Y. RODRIGUEZ, WEIPING GOU, V. GORUGANTI, JOSEPH H. ROSS, JR., Department of Physics, Texas A&M University — The $Al_{20}V_2R$ system, with R = rare earth, features R atoms in 16-atom Al cages. Our previous work on $Al_{20}V_2Eu$ showed the development of underscreened Kondo behavior at low temperatures. From ^{27}Al NMR measurements of nonmagnetic $Al_{20}V_2La$ we identify the local electronic behavior of all three Al framework sites, and T_1 measurements indicate a significant difference between the behavior of two of the sites. At high temperatures, pseudogap behavior is observed, which is also supported by electronic calculations using the WIEN2k package. These calculations are also in excellent agreement with the measured specific heat. We conclude that the spin-fluctuation behavior in $Al_{20}V_2Eu$ results from the rare-earth atom rather than from the Al-V framework. Transport measurements also could be fit to a Bloch-Gruneisen behavior, and by taking the difference, the magnetic contribution to the resistivity of $Al_{20}V_2Eu$ could be identified, including a T-linear magnetoresistance which disappears at about 100 K, along with the apperance of Kondo behavior.

[1]This work was supported by Robert A. Welch Foundation (Grant A-1526).

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Date submitted: 07 Oct 2007 Electronic form version 1.4