Abstract Submitted
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Geometrical frustration, heavy fermions, and lattice disorder in uranium and cerium intermetallics Y. JIANG, C. H. BOOTH, Lawrence Berkeley National Laboratory, P. H. TOBASH, E. D. BAUER, J. D. THOMPSON, Los Alamos National Laboratory — Geometrical frustration may lead to a variety of interesting states of matter such as spin super-solids, spin-ice, or spin-liquids. While frustration has been widely studied in oxides such as the pyrochlores or Mott insulators, the effect of geometrical frustration on the development of the heavy-fermion state or quantum criticality in intermetallic compounds has received much less attention. Samples from two classes of geometrically frustrated heavy fermion materials based on the hexagonal CaCu5 and cubic AuBe5 have been synthesized: $CeCu_{4-x}Al_x$, $UAuPt_4$, $UAuCu_4$, and $USnCo_4$. Magnetic data will be presented to try and quantify the degree of frustration. In addition, since lattice disorder can play a large role in defining magnetic properties in frustrated systems and because of the known Pd/Cu site/anti-site disorder in UPdCu4, extended x-ray absorption fine-structure (EXAFS) data have also been obtained. The local structure results will be discussed and related to the magnetic properties.

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