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Investigation of the physical properties of the new heavy fermion compounds $Ce_2MAl_7Ge_4$ (M = Co, Ir, Ni, Pd) NIRMAL GHIMIRE[1], Los Alamos National Laboratory, SAMANTHA CARY, THOMAS ALBRECHT-SCHMITT, Florida State University, CRAIG BROWN, National Institute of Standards and Technology, SERENA ELEY, NICHOLAS WAKEHAM, PRISCILA ROSA, MARC JANOSCHEK, LEONARDO CIVALE, JOE THOMPSON, FILIP RONNING, ERIC BAUER, Los Alamos National Laboratory — Ce-based intermetallic compounds provide a fascinating ground to study several exotic physical phenomena due to the presence of competing low Kondo and RKKY interactions. One widely explored entity in these compounds is the quantum phase transition that is accessed by the suppression of the magnetic order down to absolute temperature by an external parameter such as magnetic field, chemical substitution, or pressure. Exotic phenomena like unconventional superconductivity and non-Fermi liquid behavior are ubiquitous in the vicinity of the quantum critical point. Quantum criticality in these Ce-based materials is often observed in layered, tetragonal systems such as the CeM_2X_2 (M=transition metal; X=Si, Ge) or $CeMIn_5$ (M=Co, Rh, Ir) compounds. We present the structural and physical properties of a new family of heavy fermion compounds $Ce_2MAl_7Ge_4$ (M = Co, Ir, Ni, Pd) that crystallize in the tetragonal space group P-42_1m. $Ce_2MAl_7Ge_4$ (M=Co, Ir, Ni) show complex magnetic order below 2 K, while $Ce_2PdAl_7Ge_4$ does not order magnetically down to 400 mK, and, instead, shows quantum critical behavior at low temperature.

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