Abstract Submitted
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Investigating the Role of Disorder, Electron Concentration, and Lattice Compression on Heaviness of Uranium-based Compounds ETERI SVANIDZE, ALFRED AMON, ANDREAS LEITHE-JASPER, YURI GRIN, Max Planck Institute for Chemical Physics of Solids — Uranium intermetallic compounds exhibit a wide range of exotic properties – unconventional superconductivity and quantum criticality, complex magnetic configurations, as well as heavy fermion and non-Fermi liquid behaviors. And while all of these phenomena are related to the degree of localization of the $5f$ electronic states, the complete understanding of underlying mechanisms is still lacking, explaining the unceasing interest in heavy fermion systems. One of the avenues in the search for heavy fermions has focused on compounds with high coordination number and, therefore, low concentration of U atoms. One such example is given by U_2Zn_{17} – a heavy fermion antiferromagnet which exhibits a Sommerfeld coefficient $\gamma = 0.4$ J/mol K^2. In the presented work, the value of γ was doubled by substituting all of Zn atoms by Cu and Ga, resulting in $U_2Cu_{17-x}Ga_x$. Moreover, this drastic effect is accompanied by non-Fermi liquid behavior. We analyze the relation between crystal structure, magnetic, and electronic properties of the $U_2Cu_{17-x}Ga_x$ compounds.

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