Modeling the Effect of Chemical Substitution and High Pressure on the Electronic Instabilities of the Ternary Intermetallics CeMIn$_5$ ($M = \text{Co, Rh, Ir}$)

Jose V. Alvarez and Felix Yndurain

Departamento de Física de la Materia Condensada, Universidad Autónoma de Madrid, 28049 Madrid, Spain

Reprint requests to Jose V. Alvarez. E-mail: jv.alvarez@uam.es


Dedicated to Professor Gérard Demazau on the occasion of his 65th birthday

The phase diagram of the ternary intermetallics CeMIn$_5$ ($M = \text{Co, Rh, In}$) presents new forms of competition and coexistence between magnetic and superconducting phases. We briefly review the experiments that have outlined the temperature-pressure phase diagram of these materials, emphasizing the phenomenon of reversible tuning. Expanding a recently proposed model for the coexistence of antiferromagnetism and superconductivity, we study the role of electronic doping on the ordering temperatures of these phases.

Key words: CeMIn$_5$, Magnetism, Superconductivity, Pressure