

Quantum Phase Transition at A Critical Composition

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Since the singe and strength of both on-site and inter-site exchange is strongly depends on the (i)character and concentration of conduction electron (ii) number of nearest neighbour of magnetic ions and(iii) the inter-atomic space defined by the correlation length $R_c=2kfR_{ij}$, There exist a critical point at which a competition can occur. For Gd Intermetallic Compound (IMC) which is on its stable – s – state, the origin of this should be a puzzle. In spite of the above phenomenon for which the on-site exchange is the cause of screening and gives $TK>TN$, the field induced by the metamagnetic character can be changed by increasing of the magnetic ions concentration up to a critical point at which a critical quantum phase transition is manifested for a critical composition where, the unstable F.M phase transition collapses to completely P.M state with Kondo lattice behaviour and the super-lattice behaviour can be observed.