



569th ASRC Seminar

Date: 10:00 ~ 11:00, 30 October

Location: Meeting room 103, ASRC Building

Speaker: Dr. Kazushi Aoyama
(Osaka University)

Title: Superconductivity in anisotropic
ferromagnets near a transverse
saturation field

In the uranium compounds such as URhGe, UCoGe, and UGe₂, superconductivity emerges inside ferromagnetic phases and exhibits a reentrant behavior in a magnetic field. In this study, we focus on URhGe and theoretically investigate the origin of the field-induced reentrant superconductivity. In URhGe, with increasing an external magnetic field applied perpendicularly to an easy axis of a ferromagnetic moment, the superconducting transition temperature T_c is gradually suppressed to zero and starts increasing again at a high field. The higher-field T_c takes its maximum value near a saturation field H_s at which the ferromagnetic moment is completely aligned along the field direction, and the effective electron mass is also enhanced toward H_s [1].

•Motivated by the experimental observation, we consider a model for superconductivity in an anisotropic ferromagnet under transverse field. We derive the spectrum of critical magnetic excitations near the saturation field, and found that as pointed out by Hattori and Tsunetsugu [2], ferromagnetic magnons softened by the transverse field play an important role. In this presentation, we will discuss electron-magnon coupling effects on electronic and magnetic properties and compare our results with experiments on URhGe.



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