

Introduction of the RIKEN-RAL Muon Facility in the UK and Applications of Muons to Materials Science



Abstract

RIKEN is one of Japanese national institutes for natural sciences including accelerator physics. Our laboratory has established the RIKEN-RAL Muon Facility at the Rutherford-Appleton Laboratory in the UK in 1994. The world-strongest intense pulsed muon beam is available at the RIKEN-RAL for materials science. We have collaborated with more than 60 Japanese and 20 international groups in the past 17 years and we are still looking for more active collaborators in order to achieve good sciences using muons.

In my talk, I would like to introduce our RIKEN-RAL Muon Facility, what is the muon, and how we can apply muons to materials science, that is, the technique named μ SR (muon spin relaxation/rotation/resonance). μ SR is a microscopic tool to sense the spin dynamics with the unique characteristic time window which is in between NMR and the neutron scattering ($10^{-6} - 10^{-11}$ sec). This character as an experimental tool could give us complementally and/or uniquely interesting results on the spin dynamics and electronic states. In addition to usual μ SR techniques, I would like to introduce some special μ SR techniques for materials science.



In order to introduce how to use μ SR, I do not concentrate on one specified experimental result but I would like to talk about some μ SR results on superconducting materials, magnetic materials and metal complexes. Recent important and successive applications are for the Fe-based superconducting oxides, a BEDT-TTF quantum spin-liquid system and a low-dimensional metal-complex change magnet. These researches are for the study of the dynamics of small spins and to determine the magnetic phase diagram and the gap state. Although I cannot follow all of μ SR topics within the limited time, I will also introduce other important μ SR applications and results for your references to think about possible plans to use muons. I strongly hope that some of you researchers will be interested in collaborating with RIKEN.

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Offering opportunities for:

- Research at RIKEN Japan for doctoral students in physics or materials science under UI-RIKEN sandwich program
- Use of RIKEN-RAL research facilities for Indonesian researchers

There will be interviews for candidates interested to apply

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Wednesday

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13.00 – 15.00 WIB



Main Seminar Room, Dept. of Physics, FMIPA UI, Depok

This seminar is open to the public (students, lectures, researchers, etc.) and free of charge