Solid State Physics in UK Temperatures-electron & nuclear

1997 Fiscal Year Final Research Report Summary

Solid State Physics in UK Temperatures-electron & nuclear

Research Project

Project/Area Number

08304025

Research Category

Grant-in-Aid for Scientific Research (A)

Allocation Type

Single-year Grants

Section

一般

Research Field

固体物性Ⅱ(磁性・金属・低温)

Research Institution

Kanazawa University

Principal Investigator

SUZUKI Haruhiko Kanazawa University, Faculty of Science, Prof., 理学部, 教授 (50004370)

Co-Investigator(Kenkyū-buntansha)

HATA Tohru Osaka City University, Faculty of Science, Assoc.Prof., 理学部, 助教授 (10156333)
FUKUYAMA Hiroshi Tsukuba University, Department of Physics, Assoc.Prof., 物理学系, 助教授 (00181298)
ISHII Hiromi Osaka City University, Fuculty of Science, Prof., 理学部, 教授 (80047167)
MAMIYA Takayoshi Nagoya University, graduate school of Science, Prof., 理学研究科, 教授 (20022600)
ONUKI Yoshichika Osaka University, graduate school of Science, Prof., 理学研究科, 教授 (40118659)

Project Period (FY)

1996 – 1997

Keywords

Nuclear Magnetism / Ultra Low Temperature / Heavey electrons / Relaxation Time

Research Abstract

In 1996, we had meeting twice. We discussed our co-works projects. Then we determined the main project that ultra-low temperature measurements for high qualty rare earth copmound crystal produced by Prof.Onuki's group.
We will report some results of the project.
1) CeRu2Si2 ; Kanazawa University : The magnetic susceptibility measurements were done for CeRu2Si2 single crystal which is known as the nonmagnetic and nonsuperonducting heavy electron compoud. The magnetic susceptibility increases monotonically down to 300mk. The magnetic susceptibility suggests the small magnetic moment<approximately equal>0.02mu_B. This results suggests that the crystal is of very good qualty.
2) PrIn3 ; ISSP : PrIn3 compound is the hyperfine-enhanced nuclear spin system. The nuclear spin ordering was observed at 0.13 mK.From the specific heat and the magnetization measurements, the magnetic spin structure was estimated.
3) PrCu6 ; Osaka City University : The hyperfine-enhanced nuclear spin system PrCu6 orders at 2.2mK.The domain structure was observed. This is the first observation of he domain structure of nuclear spin system in a laboratory frame.

Research Products (12 results)

All | Other

All | Publications (12 results)

[Publications] H.Ishii: "Relaxation of exchange-coupled nuclcar spins under guadupsle interatin" Czech,J.Phys.46,S2. 2219-2220 (1996)

[Publications] K.Akashi: "Nuclear susceptibility near Tc in a Van Vleck PrCub." Czech,J.Phys.46,S1. 2211-2212 (1996)

[Publications] H.Ishida: "Low Temperature Heat-Capacity Anomalies in 2-D Solid^3H" Phys,Rev.Letters. 79. 3451-3454 (1997)

[Publications] T.Mamiya: "Specibic Heat Anomaly in Solid^3He due to Vaconuy New" J.Low Temp.Phys.110. 109-114 (1998)

[Publications] Yoshihiro Koike: "Magnetic Susceptibility of Sc Single Crystal" J.Low Temp.Phys.107.1/2. 197-208 (1997)

[Publications] H.Suzuki: "Nuclear Spin order of scandium" Czech,J.Phys.46,S4. 2183-2184 (1996)

[Publications] H.Ishii and A.Oguri: "Relaxation of exchange-coupled nuclear spins nuder quadrupole interaction" Czech.J.Phys.46 S2. 2219-2220 (1996)

[Publications] K.Akashi, K.Kawabata, A.Matsubara, O.Ishikawa, T.Hata, K.Kodama and Y.Onuki: "Nuclear Susceptibility near Tc in a Van Vleck Paramagnet PrCu6" Czech.J.Phys.46 S1. 2211-2212 (1996)

[Publications] K.Ishida, m.Morishita, K.Yawata and H.Fukuyama: "Low Temperature Heat-Capacity Anomalies in Two-Dimensional Solid 3He" Phys.Rev.Lett.79. 3451-3454 (1997)

[Publications] T.Mamiya et al.: "Specific Heat Anomaly in Solid 3He due to Vacancy wave" J.Low.Temp.Phys.110. 109-208 (1998)

[Publications] Y.Koike and H.Suzuki: "Magnetic Susceptibility of Sc Single Crystal" Low Temp.Phys.107. 197-208 (1997)

[Publications] H.Suzuki, T.Koike, Y.Karaki, M.Kubota and H.Ishimoto: "Nuclear spin order of scandium" czech.J.Phys.46 S4. 2183-2184 (1996)

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-08304025/083040251997kenkyu_seika_hokoku_

Published: 1999-03-15