

## Pressure effect to quadrupole transition on PrPb<sub>3</sub>

M. Kano<sup>1</sup>, N. Kurita<sup>1</sup>, M. Hedo<sup>1</sup>, Y. Uwatoko<sup>1</sup>, S. W. Tozer<sup>2</sup>, H. S. Suzuki<sup>3</sup>, T. Onimaru<sup>1</sup> and T. Sakakibara<sup>1</sup>

<sup>1</sup>Institute for Solid State Physics, University of Tokyo, Kashiwa, 277-8581

<sup>2</sup>National High Magnetic Field Laboratory, Tallahassee, 31320-3706

<sup>3</sup>National Institute for Material Science, Tsukuba, 305-0047

The rare-earth intermetallic compound PrPb<sub>3</sub> has the AuCu<sub>3</sub>-type cubic structure, and its crystalline field ground state is a  $\Gamma_3$  non-Kramers doublet which is orbitally degenerated. It is characterized by carrying the quadrupole moments of  $O_2^0$  and  $O_2^2$ , not having a magnetic degrees of freedom, also an anomaly due to antiferroquadrupolar (AFQ) is observed at 0.4 K in the specific heat [1]. Recently, neutron diffraction technique revealed the existence of spatially modulated AFQ structure in PrPb<sub>3</sub> by Onimaru et al [2]. It suggests that an indirect RKKY-type interaction between quadrupole moments should exist. With the aim of controlling this interaction, we carried out the electrical resistivity measurements on PrPb<sub>3</sub> under high pressure up to 8 GPa. As a result, a gradual rise of the kink temperature ( $T_Q$ ) is observed with increasing pressure and it suddenly disappears around 5 GPa. In the presentation, reasons for this phenomenon as the pressure effect will be argued.

[1] M. Nicksch et al.: *Helv. Phys. Acta* **55** (1982) 688

[2] T. Onimaru et al.: *Phys. Rev. Lett.* **94** (2005) 197201

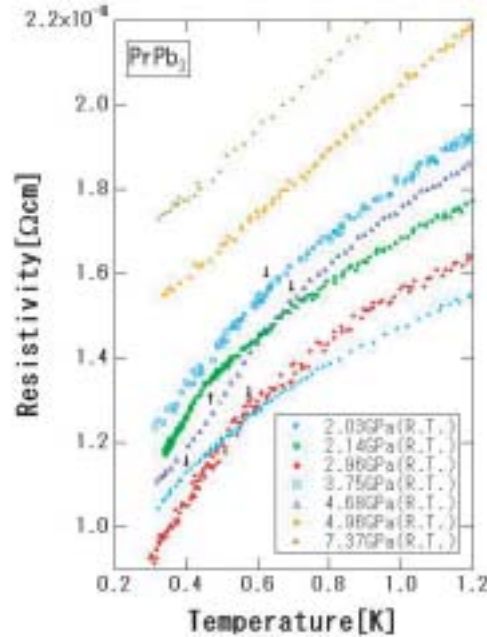


Figure 1: Temperature dependence of resistivity on PrPb<sub>3</sub> at various pressures.