



Contribution ID : 23

Type : not specified

Incommensurate magnetic order in PrNiAl_4

The $R\text{NiAl}_4$ intermetallic series (where $R = \text{Ln}^{3+}$) has been the subject of much investigation over a number of years. These compounds are known to possess some interesting magnetic behaviours including multiple magnetic phases and metamagnetism. TbNiAl_4 , ErNiAl_4 and NdNiAl_4 are all known to have incommensurate magnetic structures determined from neutron diffraction[1-3], whereas the presence of an incommensurate magnetic phase in PrNiAl_4 is more tentative, based only on specific heat and magnetisation measurements[4]. Recent neutron powder diffraction experiments have confirmed the presence of this incommensurate magnetic phase at 7 K and 7.5 K, well within the range of 6.9-8.1 K predicted by the specific heat data. Analysis of the diffraction patterns puts the propagation vector of the magnetic phase at $\mathbf{k} = (0.071(1), 1, 0)$, with the magnetic moments pointing along the a -axis.

[1] Hutchison W D, Goossens D J, Nishimura K, Mori K, Isikawa Y and Studer A J 2006 *Journal of Magnetism and Magnetic Materials* **301** 352-8

[2] Hutchison W D, Goossens D J, Saensunon B, Stewart G A, Avdeev M and Nishimura K 2007 *31st Annual Condensed Matter and Materials Meeting, (Wagga Wagga)* Vol. 1 (Australian Institute of Physics)

[3] Mizushima T, Isikawa Y, Sakurai J, Mori K, Fukuhara T, Maezawa K, Schweizer J and Ressouche E 1994 *Physica B* **194** 225-6

[4] Nishimura K, Yasukawa T, Mori K, Isikawa Y, Hutchison W D and Chaplin D H 2003 *Japanese Journal of Applied Physics* **42** 5565-70

Primary author(s): Mr WHITE, Reyner (UNSW Canberra)

Co-author(s): Prof. NISHIMURA, Katsuhiko (University of Toyama); Dr AVDEEV, Maxim (Australian Nuclear Science and Technology Organisation); Dr HUTCHISON, Wayne (The University of New South Wales)

Presenter(s): Mr WHITE, Reyner (UNSW Canberra)