

## Kinken Powder Diffractometer HERMES

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The main purpose of HERMES is to obtain high quality powder diffraction data by short time measurements with easy operation. HERMES is quite suitable for many cases of experiments such as measurements of a sample of a very small amount, measurements of a lot of samples, measurements at a lot of temperatures, measurements of very weak magnetic scattering. By its user friendly GUI, even beginners can enjoy neutron experiments on HERMES.

Recently, HERMES is an important tool for structural investigations on hydrogen storage materials. In developments of novel hydrogen storage materials, understand of hydrogen structure is indispensable. Fig.1 shows the one of the recent results obtained on HERMES: the crystal structure of hydrogen compound  $\text{Li}_2\text{NH}$ . Though hydrogen atoms seem to form cages centred on each nitrogen atom, the occupancy of the hydrogen cage is much smaller than 100% so that only one hydrogen exists around one nitrogen; owing to spatial or/and time average operation of the diffraction technique, the average structure seems like that in fig.1.

In 2006, the measurement system has been replaced from the previous UNIX base system on a workstation to the Labview base system on a Windows PC. This replacement has increased expandability of measurements of HERMES. Thus, the IRT group has been trying development of novel experiments techniques using HERMES, as well as structural investigation by normal powder diffraction experiments; for instance, the neutron holography technique and scanning neutron diffraction technique, development of beam focusing device. Since these techniques need quite high experimental efficiency, HERMES is the best instrument for the experiments.

In 2006, 64 groups had experiments on

HERMES, 23 papers were published.

The detailed and latest information on HERMES can be obtained in the Web site: <http://www.yamada-lab.imr.tohoku.ac.jp/HERMES/index.html>

### Reference of HERMES

K. Ohoyama, T. Kanouchi, K. Nemoto, M. Ohashi, T. Kajitani, Y. Yamaguchi, *Jpn. J. Appl. Phys.* 37 (1998) 3319.

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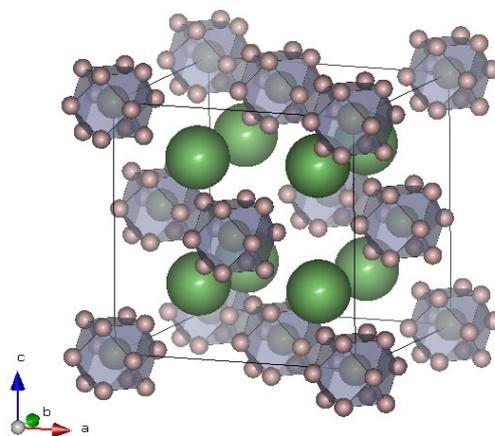


Fig. 1. Crystal Structure of  $\text{Li}_2\text{NH}$  determined on HERMES