



Experiment title: Inelastic scattering on a Al-Pd-Mn single grain quasicrystal: phonon structure

Experiment number:

HS-656

Beamline:

ID-12

Date of Experiment:

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Shifts:

15

Local contact(s):

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Report:

The two approved experiments, HS-655 and HS-656 have to do with the phonon dynamics in icosahedral quasicrystals. Due to the fact that the time for the two experiments was combined, we made the choice to first look at i-Al-Pd-Mn (HS-656), and not i-Al-Cu-Fe (HS-655). This was done because the scattering of Pd is more favourable. It was only possible to look at a powder sample. This was done at a series of different scattering vectors q , sweeping the energy shift from -1 to +1 meV ?????. The series of results obtained are shown in the figure. Our conclusions from these experiments is the following:

1. The spectra are unfortunately dominated by the central line, due to disorder in the sample. This is a result of the fact that the sample was a powder.
2. Nevertheless, optical phonons near 10 meV can be seen in the resulting spectra at small q . The acoustic phonons were not seen, but this may have been the result of the central peak being too strong.
3. The phonon dispersion curve can be measured on a single crystal, where the central peak is not so strong.

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