## **Dynamics from Diffraction**

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A model-independent approach for the extraction of detailed lattice dynamical information from neutron powder diffraction data is described. The technique is based on a statistical analysis of atomistic configurations generated using reverse Monte Carlo structural refinement.

Phonon dispersion curves extracted in this way are shown to reproduce many of the important features found in those determined independently using neutron triple-axis spectroscopy. The extent to which diffraction data are sensitive to lattice dynamics is explored in a range of materials.

The prospect that such detailed dynamical information might be accessible using comparatively facile experiments such as neutron powder diffraction is incredibly valuable when studying systems for which established spectroscopic methods are prohibitive or inappropriate.

[1] Goodwin A.L., et al., *Phys. Rev. Lett.*, 2004, **93**, 075502. [2] Goodwin A.L., et al., *Phys. Rev. B, manuscript submitted.* 

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