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Inelastic X-ray Scattering

JOHN HILL, Brookhaven National Laboratory

This presentation is devoted to review the Inelastic X-ray Scattering (IXS) method to study atomic density fluctuations. The IXS as a complement to neutrons has been suggested for many years now with a first attempt dating back to the eighties. Only the advent of Hard X-ray third generation synchrotron light sources has allowed the establishment of IXS as a powerful routine technique for condensed matter studies. It has enabled important breakthroughs in our understanding of phonon-like excitations in disordered materials and matter at extreme conditions. The very small gauge volume and possible future advances in instrumentation allow to expect further developments in phonon microscopy.