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S. J. L. Billinge
Applied Physics and Applied Mathematics Department, Columbia University, New York, NY 10027.
Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, Upton, NY 11973

Recent developments in atomic pair distribution function analysis applied to amorphous and nanocrystalline materials

Diffraction methods have been applied to study the structure of glasses for more than 70 years. However, recently in the context of the study of disorder in crystalline and nanocrystalline materials, a number of developments have been made that are leading to new insights in various areas of complex-materials science. The developments are in both measurement methodologies and in modelling. I will present these novel developments and discuss some ways in which they may be pertinent to glass research.

What kind of information your synchrotron technique may provide?

Structural information, information on strains in the material, especially nanomaterials

What is the basic principle of your technique?

Diffraction

What are the limitations of your technique?

Amorphous materials inherently yield limited structural information. High dilution of a phase or species of interest.

What kind of sample does one need - i.e. minimum/maximum sample dimensions/shapes?

The smallest size that can be studied currently are chunks of glass ~1mm square and thickness ~ hundred microns. These dimensions will get smaller at future sources.

A brief bibliography of relevant review articles.

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