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Detecting Hidden Symmetries with Coherent X-Ray Diffraction[1]
THOMAS DEMMER, ALEJANDRO DIAZ ORTIZ, PETER WOCHNER, HELMUT DOSCH, Max Planck Institute for Metals Research — An approach to analyze x-ray coherent diffraction patterns of amorphous systems is presented. We have investigated archetype hard-sphere systems where the local environment is simulated using different hundreds of geometric structures (i.e., regular and irregular polyhedra). The effect of positional and orientation randomness on the coherent diffraction pattern is studied numerically for samples containing up to 10^7 particles. A library of such simulated diffraction data is then used to retrieve the underlying symmetries in amorphous systems. A discussion of the relevant experimental work is also presented.

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Alejandro Diaz Ortiz
Max Planck Institute for Metals Research

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