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X-ray Scattering Studies of amorphous thin film materials

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In light of advances in detector technology, we revisit wide angle x-ray scattering techniques and their application to amorphous thin films that are of technological importance. For thin film materials the asymmetrical reflection geometry is employed to avoid the substrate signals. Incident x-ray angles are typically set close to the critical angles. There are various complications related to this geometry, in particular, raw scattering patterns being distorted. In addition, because these materials are typically weak scatterers due to disorder, increased data collection efficiency is always desired. Here, we report our activities using a 4-element vortex Si-drift detector for wide angle x-ray scattering experiments and present some experimental data collected on amorphous transparent conducting oxides.

Keywords: X-ray Scattering, Pair Distribution Function, Amorphous Transparent Conducting oxides