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Powder diffraction computed tomography: a combined synchrotron and neutron study

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Diffraction and imaging using X-rays and neutrons are widely utilized in different fields of engineering, biology, chemistry and/or materials science. Combined information gained by X-ray diffraction computed tomography (XRD-CT) is a powerful approach with high potential due to enhanced sensitivity of the method. Its active development over the last decade revealed structural details in a non-destructive way with unprecedented sensitivity. In the current contribution a first attempt to adopt well-established XRD-CT technique for neutron diffraction computed tomography (ND-CT) is reported. A specially designed "phantom", an object displaying adaptable contrast sufficient for both XRD-CT and ND-CT was used for method validation. The feasibility of ND-CT was demonstrated and it was also shown that ND-CT technique is capable to provide a non-destructive view into the interrrior of the "phantom"delivering structural information consistent with a reference XRD-CT experiment.

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