



X-ray and neutron Line Profile Analysis of Microstructures

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Deadline for manuscript
submissions:
closed (15 January 2020)

Message from the Guest Editors

Dear Colleagues,

X-ray and neutron line profile analysis proves to be an ever more powerful method to reveal many different quantitative aspects of microstructure properties in crystalline materials. It has become one of the most widely used complementary tools to electron microscopy for characterizing microstructures of materials. Functional properties of crystalline materials are determined by both the crystal structure and the imperfectness of crystal structure, where imperfectness comprises of a large variety of lattice defects. When the crystal lattice becomes imperfect diffraction peaks broaden and the kind and type of broadening also reveals great variety. Coherently scattering domains gives size broadening, dislocations, intergranular strains, thermal anisotropy in non-cubic crystals or misfit between matrix and second-phase particles produce strain broadening, planar defects of different kinds make peaks shift and broaden, chemical inhomogeneities on different scales produce specific peak shifts and shapes.

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Message from the Editor-in-Chief

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