

Techniques for Neutron Stress Determination with High Spatial Resolution

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Many sub-surface strain measurement problems require spatial resolutions of the order of 10^{-1} mm to be meaningful. The use of neutron diffraction can be both time effective and otherwise advantageous compared to synchrotron radiation if measurement directions and beam shapes are chosen such that scattered intensity is maximized. The first point refers to preferred orientation which boosts the diffracted intensity in certain directions; the second point refers to the shaping of the incident beam for maximizing the illuminated volume in the material even for curved specimens. Guidelines and limitations such high spatial resolution measurements are discussed.