

Calcul des corrections d'absorption des Neutrons par La Méthode de Monte Carlo sur des Echantillons de Poudres Cristallines

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Abstract : We have studied the angular behavior of the absorption coefficient in diffraction experiments of thermal neutrons incident on highly absorbing cylindrical samples. We have thus developed a code based on the Monte Carlo method to carry out the transport of such thermal neutrons and the evaluation of the finite-geometry induced effects, in addition to the study of the role played by multiple scattering, the absorption and the shape of the scattering sample as well. Thus, we were able to determine that the angular behavior of the transmission coefficient of the full-cylinder geometry is different from that of an annular-cylinder geometry containing the same number of scattering material. An enhancement of the diffracted intensity by a factor of 10, for small Bragg angles, is observed whenever the annular-cylinder shape is used instead of the full-cylinder one. Our code is further validated by the agreement of its results with those obtained previously par other workers using semi analytic methods.

Keywords : Absorption coefficient, thermal neutrons, highly absorbing cylindrical samples, Monte Carlo Method