

# A Generalized Debye Scattering Formula and the Hankel Transform

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Z. Naturforsch. **54 a**, 124–130 (1999); received December 15, 1998

The diffracted intensity of an x-ray or neutron diffraction experiment is expressed as an integral over an atomic position distribution function. A generalized Debye scattering formula results. Since this distribution function is expanded into a series of spherical harmonics, an inverse Hankel transform of the intensity allows the calculation of the expansion coefficients which describe the atomic arrangement completely. The connections between the generalized Debye scattering formula and the original Debye formula as well as the Laue scattering formula are derived.

*Key words:* X-ray Scattering; Debye Formula; Hankel Transform.

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