

3.3: Anomalous dispersion

The 'anomalous' dispersion corrections, which are not in fact anomalous, take into account the effect of absorption in the scattering of phonons by electrons. In the classic picture the electron is approximated by a damped harmonic oscillator. The scattering factor of the electron is then complex and the atomic scattering factor, or atomic form factor, is given by:

$$f + f' + i f''$$

where f' and f'' are the real and imaginary parts of the anomalous dispersion correction. Their importance increases as one gets closer to an absorption edge (resonant scattering). Numerical calculations usually follow the Hartree-Fock approximations. For details on the non-relativistic and relativistic approaches, see Section 4.2.6 of *International Tables of Crystallography, Volume C*.

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