A three-dimensional description of the electron density in a crystal structure, determined from X-ray diffraction experiments. X-rays scatter from the electron clouds of atoms in the crystal lattice; the diffracted waves from scattering planes $h,k,l$ are described by structure factors $F_{hkl}$.

The electron density as a function of position $x,y,z$ is the Fourier transform of the structure factors:

$$\rho(xyz) = \frac{1}{V} \sum_{hkl} F(hkl) \exp[-2\pi i(hx + ky + lz)]$$

The electron density map describes the contents of the unit cells averaged over the whole crystal and not the contents of a single unit cell (a distinction that is important where structural disorder is present).

Three-dimensional maps are often evaluated as parallel two-dimensional contoured sections at different heights in the unit cell.

**Units**

Electron density is measured in electrons per cubic ångström, e Å$^{-3}$.

**Contributors**

- Online Dictionary of Crystallography