A Heuristic Model for Spectral-Line-Profiles

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Abstract

By means of the Fourier-transformation for the statistical *Poisson*-distribution a function $y(x)$ is obtained, which is called in this paper *Lorentz*-function of the n-th degree:

$$y = (1 + x^2)^{-n}.$$

Special cases such as $n = 1$ or $n \to \infty$ are used for representing types of spectral lines: the *Lorentz*- or dispersion-type and the *Gauss*-type, resp. Up to now the region between these two types has been represented by the so-called *Voigt*-function. The new general *Lorentz*-function is suitable for approximating or replacing the complicated *Voigt*-function.

The general *Lorentz*-function is based upon an abstract model which is valid for processes in kinetic systems or in electronic networks.

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