## 3.17: Kinematical theory

In the **kinematical** or **geometrical** theory, the amplitudes diffracted by a three-dimensional periodic assembly of atoms (Laue) or by a stack of planes (Darwin) is derived by adding the amplitudes of the waves diffracted by each atom or by each plane, simply taking into account the optical path differences between them, but neglecting the interaction of the propagating waves and matter. This approximation is not compatible with the law of conservation of energy and is only valid for very small or highly imperfect crystals. The purpose of the dynamical theory is to take this interaction into account .