



Contribution ID: 33

Type: Poster

PS3-22 Two-Elliptic Coordinates for Study the Scattering of Particles in Arbitrary Bent Crystal

Thursday, 9 October 2014 17:00 (1h 30m)

It is well known that main source of orthogonal coordinate systems is a conformal transformation, but the use of analytical functions

for separation of Schrodinger or Helmholtz equations in 2D space is restricted to only 4 coordinate systems: Cartesian, polar, parabolic and elliptic. The first 3 coordinate systems are unique and can be considered as degenerated cases of the last one. In fact, the elliptic coordinate system includes an infinite number of coordinate systems, each of which is generated by one focal distance f .

We show that the combination of several elliptic coordinate systems with different foci is a new unlimited source of orthogonal coordinate systems which can admit the separation of variables for Schrodinger, Helmholtz and similar equations.

The eigenfunctions and eigenvalues are constructed for these systems and compared with Mathieu's. The results are illustrated by classical examples: the vibration of an asymmetrical membrane, asymmetrical quantum pendulum, and particular the problem of scattering of relativistic particles in bent crystals.

Primary author: Dr KOVALEV, Gennady (UofM)

Presenter: Dr KOVALEV, Gennady (UofM)

Session Classification: Poster Session