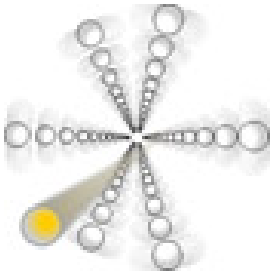

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Scattering of Relativistic Particles in Bent Crystal with Variable Curvature

Tuesday, 25 September 2012 10:10 (15 minutes)

The scattering of relativistic particles in a bent crystal potential with a
variable curvature is considered using QM curvilinear squared Dirac equation and its classical relativistic spinless analogue with account of a dissipation.
The equations are solved numerically and the result demonstrates
several distinct features:
• The reflection of positive and negative particles when.
• The refraction of positive and negative particles, even
in the case of zero friction.
• The negative singularities (spiral scattering).
• The total number of refracted particles has a maximum near a critical
curvature. For high curvature, the number of refracted and reflected particles
becomes equal.
• For thin crystal, there is ”the effect of empty core”: positive particles
are refracted, negative particles are deflected.
• The phenomenon of spiral scattering and refraction is a primary coherent
effect and exists in the absence of dissipation.

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