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Quasichanneling oscillations in the deflection angle distribution in a bent crystal

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Charged particles under over-barrier states but still close to channeling conditions experience transverse oscillations named quasichanneling oscillations.

We demonstrate both theoretically and by Monte Carlo simulations that such kind of oscillations can be directly observed in the deflection angle distribution behind a bent crystal for both positively and negatively charged particles. We provide a theoretical interpretation for them as well as discuss their peculiarities for (110) and (111) planes in a silicon crystal. We optimize realistic experimental conditions for their observation as well as energy scaling of these conditions. In addition, we discuss the possibility of application of quasichanneling oscillations in the deflection angle distribution to measure the radius of bent crystal and the angle of crystal alignment.

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