



Contribution ID: 31

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# Observation of a Remarkable Deflection of Multi-GeV Electron Beams by a thin Crystal

*Wednesday, 8 October 2014 09:00 (30 minutes)*

Comparatively little data exists for channeling and volume-reflection of electrons in the 1 to 10 GeV energy range. In this talk I will report on recent experiments at SLAC on channeling and volume reflection of a high-energy electron beam using a 60 micron thick quasimosaic Si(111) crystal. The experiments were done at several beam energies in the range of 3 to above 10 GeV. We have observed deflections of the beam of more than 400 microrad with about 23% efficiency in channeling orientation, while volume-reflection deflects almost the whole beam with 86-95% efficiency by angles close to the Lindhard critical angle. Quantitative measurements of channeling efficiency, surface transmission and dechanneling length were taken for all energies. The amount and precision of the data allow us to investigate the shape of the dechanneling tail function and, thus, investigate the physics of the dechanneling process in some detail. Scattering angles in the non-channeling plane indicate the degree of change of density of the beam electrons at the nuclear positions in the crystal lattice while channeling. I will report on the experimental results and comparison to simulations as well as the plans for successor experiments at SLAC, involving both beam-collimation experiments as well as experiments designed for spectroscopy of the gamma radiation emitted during channeling and volume reflection.

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