



Contribution ID: 41

Type: **not specified**

Experimental and Theoretical Study of PXRC (Parametric X-Radiation at Channeling) from 255 MeV Electrons in Si

Thursday, 27 September 2012 19:24 (1 minute)

The X-radiation from relativistic channelled electrons at the Bragg angles –Parametric X-Radiation at Channeling (PXRC) –is studied both experimentally and theoretically.

The experiment was carried out using a 255 MeV electron beam from a linac at newly constructed beam line for the study of interactions between a relativistic electron beam and crystals at the SAGA Light Source. The observed asymmetry of PXRC angular distribution at (220) planar channelling in a 20 μm Si is explained taking account of two quantum effects: initial population and transverse form-factor of quantum states of planar channelled electrons. Further perspectives for PXRC studies at SAGA-LS are analyzed.

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Session Classification: PS2 Poster Session

Track Classification: Poster Session