

Channeling Radiation from GeV Electrons in Diamond

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Abstract

We propose to study the properties of channeling radiation produced by electrons in the energy region of a few GeV passing through single crystals of diamond along its major crystalline planes and axes. The unprecedented emittance, resolution, and stability of the CEBAF machine, together with the combination of goniometer, photon tagger, and beam-profile detector system in Hall B, make possible measurements of coherent radiation at high energies that were heretofore impossible. In addition to mapping out the properties of channeling radiation as a function of various experimental parameters, we shall test the existence of nonlinear effects that have been predicted, or for which previous evidence is weak.

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