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Study of the Polarization Properties of Coherent Smith-Purcell Radiation at the LUCX (KEK) facility

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A study of the polarization of coherent Smith-Purcell Radiation (cSPr) has been carried out at the LUCX (KEK) facility using an 8 MeV electron beam. Two orthogonal polarizations of the radiation were measured and the degree of polarization was calculated. The experimental result was compared to simulation results calculated using a semi-analytical surface current model. Two dimensional scans were carried out in order to study the intensity distribution of cSPr for both polarizations. Potential applications of highly polarized cSPr to longitudinal beam diagnostics are discussed with respect to the results presented.

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