

Production of channeling radiation at the HBESL and ASTA facilities

When relativistic electrons propagate parallel to planar channels in a crystal lattice, they can oscillate about the crystal planes emitting an undulator like radiation known as Channeling Radiation. We plan to use our novel photo and field emission cathodes to generate very small emittance electron beams to make a channeling radiation X-ray source. This experiment is currently under construction and will be done as a proof of concept at the High Brightness Electron Source Lab (HBESL) with 4 MeV electrons then later at the Advanced Superconducting Test Accelerator (ASTA) with 40 MeV electrons. We hope to see channeling radiation with peaks well above that of the also present bremsstrahlung, and with high spectral brilliance, making channeling radiation a possible option for a compact X-ray Source.

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