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Extreme focusing of high-energy beams using near-field coherent transition radiation

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While the well-known transition radiation usually has negligible impact on high-energy beams, high-current beams such as those from the FACET-II facility can be strongly self-focused by the near field of transition radiation when passing through multiple closely spaced foils. This extreme focusing of high-energy beams opens a new physics frontier with unprecedented densities, potentially approaching that of a solid. The E-332 experiment at SLAC National Accelerator Laboratory has reached a first critical milestone with the experimental demonstration of a collective interaction between a high-energy beam and a multifoil target, whereby the focusing nature of the interaction has been evidenced. This major experimental achievement and future plans will be presented.

Working group

WG5 : Beam sources, monitoring and control

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