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Hadron Photon Colliders as photo-cathode sources of low emittance muon beams

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We discuss the possibility to generate low emittance muon beams by colliding high energy hadrons and counterpropagating high brilliance photon pulses.

The asymmetric collision of Large Hadron Collider/Future Circular Collider like hadrons and FEL keV photons imparts a strong Lorentz boost to the secondary particles which are emitted at hundreds GeV energy within a small angle around the hadron beam propagation axis.

The phase spaces of the emitted particles are simulated by means of an event-generator code and the characteristics of the muon beams are compared to the analytical calculations.

The brightness of the secondary (muon, pion, neutrino, electron, positron) beams is calculated and a preliminary evaluation of the hadron beam degradation after the interaction is given.

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