

Beam Dynamics Challenges of a Far-Future ERL-Based Collider - The Ghost Collider

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In a recent paper, Valery Telnov proposed a linear collider based on twin axis cavities [1]. In a subsequent presentation, Erk Jensen proposed a modification with intra-bucket energy recovery [2], which eliminates higher order mode excitation. Interestingly, this means that there is no need for large aperture SRF cavities and high-power HOM couplers. The Ghost Collider adopts these ideas, and adds the concept of four-beam collisions (initially proposed by Joel LeDuff [3]) to remove beam-beam interactions and disruption. This concept brings up a series of new beam dynamics problems which make optimization of the parameters difficult. The presentation will describe the concept, which has a series of beam-dynamics challenges to be solved before the concept can advance.

[1] V.I. Telnov, JINST 16 (2021) no.12, P12025

[2] E. Jensen <https://indico.cern.ch/event/1040671/?view=nicecompact>

[3] Status Report on D. C. I, The Orsay Storage Ring Group, IEEE Transactions on Nuclear Science, Vol. NS-26, No.3, June 1979

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