

# ILC Damping Ring Electron Cloud R&D effort and Single-Bunch instability simulations using CMAD

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As part of the international Linear Collider (ILC) collaboration, we have compared the electron cloud (EC) effect for different Damping Ring (DR) designs respectively with 6.4 km and 3.2 km circumference and investigated the feasibility of the shorter damping ring with respect to the electron cloud build-up and related beam instabilities. The studies for a 3.2 km ring were carried out with beam parameters of the ILC Low Power option. A reduced damping ring circumference has been proposed for the new ILC baseline design and would allow considerable reduction of the number of components, wiggler magnets and costs. We also present the results for the luminosity upgrade option with shorter 3ns bunch spacing. In particular we will go through the evaluation of mitigation techniques for the ILC DR and discuss the integration of the CesrTA results into the Damping Ring design.

Furthermore (with Kiran Sonnad, Cornell) we have performed detailed simulations using the CMAD code for CesrTA single-bunch instability and linear emittance growth below threshold and preliminary comparisons with experimental data are discussed here in view of the validation of the simulation codes prediction for the ILC DR.

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