



Contribution ID: 3

Type: **not specified**

## Combined effect of impedance and beam-beam

*Thursday 1 July 2021 11:54 (18 minutes)*

With large Piwinski angle collision, both luminosity and beam-beam tune shifts depend on the bunch length. The longitudinal beam dynamics also plays an essential role for several new effects, such as beamstrahlung, coherent X-Z instability and 3D flip-flop. The combined effect of longitudinal impedance and beam-beam interaction should be taken into account for the collider luminosity optimization. The impact on the coherent X-Z instability is focused. Simulation results are shown for different schemes: CDR, higher harmonic cavity, large momentum compaction and 4IPs.

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**Session Classification:** FCC-ee accelerators

**Track Classification:** FCCIS EU H2020 project: FCCIS WP2 (FCC-ee design)