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Estimation of the microwave instability at ALBA

Wednesday 4 June 2025 16:00 (2 hours)

In a collaborative work between ALBA and KEK the computation of the microwave instability threshold of the current ALBA ring was initiated. This analysis involves solving the dispersion relation equation*and conducting simulations using a Vlasov-Fokker-Planck (VFP) solver. The longitudinal wake fields of geometric origin of all vacuum elements were computed with GdfidL***using a bunch whose length is at least 5x smaller than the bunch length given by usual 3MV RF-voltage applied at ALBA. The resistive wall contribution was computed at first as longitudinal impedance by IW2D**** to be converted in a second step into wake fields via Fourier transform. The CSR contribution will also be considered. The impact of the 3 types of wakes on the microwave instability will be studied. The microwave instability single bunch threshold will be computed combining the 3 contributions. This work also serves as a preparation of the future evaluation of the microwave instability of the ALBA upgrade, which is expected for 2030.

Footnotes

*S.Dastan et al., PRAB 27, 104401 (2024).Y.Cai et al., PR-STAB 12, 061002 (2009).***W.Bruns, www.gdfidl.de****N.Mounet, https://gitlab.cern.ch/IRIS/IW2D

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