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Effects of the ALBA slab movement on ALBA-II

The spanish 3rd generation synchrotron light source ALBA of 268.8 m and 3 GeV, is planning to renovate the Storage Ring to a 4th generation synchrotron, called ALBA-II, to be installed in the same location. The current ALBA storage ring has been used to validate the ALBA model behavior subject to ground motion and the ALBA-II ground movement studies have been based on 6-months and 1-year cycles from 2022 and 2023 alignment data. The ground movement seems non-cumulative in the most recent years, large amplitude and low spatial frequency. The lattice could be corrected in case of either: a 6-months or 1-year of continuous motion modelled as low spatial frequency and high amplitude components that increase the orbit correction budget by less than 50 µrad and would be continuously used; or weeks/months of continuous motion modelled as girder to girder variations of 10 µrad rms cut at 2 sigma, equivant to jumps of 40 um, contributing to another 50 urad to the corrector budget. Girder movers could help to reduce the corrector budget by removing the girder-to-girder jumps. In case of non-continuous correction we expect once every 5 years at most 1 mm loss in horizontal D.A. This is the case of a long stop, for example in winter or summer, and could reduce efficiency or stop off-axis injection. As a way to mitigate this issue we will keep the possibility to come back to on-axis injection, allowing to inject, diagnose, correct and recover fully the D.A. Alternatives to increase the D.A. from design so that we can tolerate 1 mm hor. DA. loss are also foreseen.

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