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Study of insertion devices effects in SIRIUS

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SIRIUS is the 4th generation synchrotron light source built and operated by the Brazilian Synchrotron Light Laboratory (LNLS). SIRIUS is currently operating with six beamlines and eight others are at different stages of deployment. In this work we report on the development of simulation tools to analyze the impact of insertion devices (IDs) on SIRIUS beam orbit, optics and dynamic aperture (DA), aiming at defining their specifications for external suppliers and verifying the feasibility of installing existing IDs. In particular, we analyze the fields of two IDs used in the previous LNLS synchrotron light source (UVX), now decommissioned: one planar 2T hybrid wiggler and one EPU of the type Apple-II. These IDs were installed in SIRIUS in 2022 and are now temporarily serving as light sources for the commissioning of PAINEIRA and SABIÁ beamlines.

Furthermore, we also analyze the effects of two new IDs that will be used as titular light sources for CARNAÚBA, CATERETÊ, EMA, and PAINEIRA beamlines. One is an In-Vacuum Undulator (IVU) and the other is a Vertically Polarizing Undulator (VPU). An undulator built In-house will be used as a temporary light source for the SAPUCAIA beamline commissioning and its effects on SIRIUS beam parameters are also reported.

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Footnotes

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Yes

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