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Online optimization of SIRIUS nonlinear optics

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SIRIUS is the 4th generation storage ring-based synchrotron light source built and operated by the Brazilian Synchrotron Light Laboratory (LNLS). Beam accumulation at SIRIUS storage ring occurs in an off-axis scheme, using a nonlinear kicker (NLK), for which the efficiency depends on a sufficiently large dynamic aperture (DA). This work reports on the application of online optimization using the Robust Conjugate direction Search (RCDS) algorithm on SIRIUS sextupoles, which resulted in improvements to injection efficiency and DA in three different machine working tunes.

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