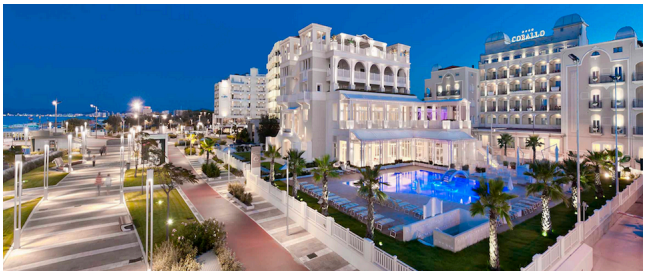

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Recent developments of the FLUKA Channeling model and benchmarking of SPS and LHC crystal-related activities

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In recent years, bent crystals have become a mature technology now exploited in several applications at CERN, such as shadowing techniques to reduce particle losses during slow extraction from the SPS as well as crystal-assisted collimation for LHC ion runs. Looking forward, they are also a key component of future plans to measure the electric and magnetic dipole moments of short-lived particles, in a double-crystal experiment in the LHC.

This increasing prevalence of bent crystals use in accelerators has driven the development of the FLUKA model of crystal channeling, presented in 2014[1]. The model is now fully incorporated in the main software and allows users to perform multiturn transport simulations in complex crystal-based geometries, with the help of independently developed tools (FLUKA-Sixtrack coupling, LineBuilder)[2,3]. This integration effort has been complemented by the refinement of several of the model components. In particular we will explore the novel analytical microscopic tracking in quasi-channeling enabling a more precise reproduction of the interaction suppression in that regime.

Finally, we give a detailed overview of experimental results obtained in the LHC and SPS, and their comparison with results of performed simulations.

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