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Looking forward to photon-coupled sub-GeV long-lived particles

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Many Dark Sector models contain photon-coupled long-lived particles. An outstanding example is an axion-like particle decaying into two photons. The forward physics detectors at the LHC, e.g., FASER, were shown to be particularly suitable for hunting \sim sub-GeV ALPs thanks to numerous photons produced in pp collisions, which in turn are efficiently converted into ALPs by the Primakoff scattering. We consider a few of beyond the SM physics scenarios in which similar processes can occur, in particular *massive spin-2 portal*, *dark axion portal*, and *inelastic DM with EM form factors*. We find that FASER2 and SHiP experiments will cover a significant part of the available parameter space for each of them. Moreover, we show that secondary production of LLPs at FASER2 can improve the coverage of parameter spaces in the regime of smaller lifetimes.

Auteur principal: JODLOWSKI, Krzysztof (IBS-CTPU)**Orateur:** JODLOWSKI, Krzysztof (IBS-CTPU)**Classification de Session:** HEP - Experiment