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R-Parity Violation and Light Neutralinos at SHiP and the LHC

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In a recent study, we looked at the sensitivity of the proposed SHiP experiment to the LQD operator in R-Parity violating supersymmetric theories. For that purpose, we focused on single neutralino production via rare meson decays and the observation of downstream neutralino decays into charged mesons inside the SHiP decay chamber. We provided a generic list of effective operators and decay width formulae for any lambda' coupling and showed the resulting expected SHiP sensitivity for a widespread list of benchmark scenarios via numerical simulations. We compared this sensitivity to expected limits from testing the same decay topology at the LHC with ATLAS in a simplified approach. In my talk, I will briefly outline the theory of R-Parity induced meson decays and explain the numerical methods to find the expected SHiP and LHC event rates before finally discussing the results.

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