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Projections on R-Parity Violating Scalar B-Quark Researches at FCC-he collider

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An evidence to beyond standard model (BSM) through the observation of particles involved in supersymmetry (SUSY) would be considered as the next breakthrough after the discovery of Higgs particle at present or future colliders. In order to fulfil that task, one has to consider a
realistic SUSY model such as R-parity violating (RPV) SUSY model that predicts reasonable approach to Standard Model (SM) issues and opens the door of various BSM possibilities enriching the particle phenomenology. In the scope of this work, we have updated the study of sbottom
resonant production improving the constraints λ′(ijk) -spesifically λ′(113) and λ′(123) - through the process e±p ⟶ ˜b* ⟶ μ±q where q denotes up-type quarks and p denotes the quarks that emerged by protons. Implementing the recent event generators and analysis tools, we show that these coupling limits can be improved to ~ 10ˆ(−2) at a confidence level 95% with the 60 (120) GeV electron beam options of the FCC-he.

Authors: KUDAY, Sinan (Ankara University (TR)); SENOL, Abdulkadir (Abant Izzet Baysal University); Dr YUKSEL, Alper Nazmi (Turkish Energy, Nuclear and Mineral Research Agency-TENMAK (Former Turkish Atomic Energy Authority))

Presenter: KUDAY, Sinan (Ankara University (TR))