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A Search for Squarks of R-Parity Violating SUSY at HERA

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A search for squarks of R-parity violating supersymmetry is performed in ep collisions at HERA using using H1 1994→1997 data corresponding to an integrated luminosity of 37 pb^{-1}. Direct single production of squarks of each generation by e^+-quark fusion via a Yukawa coupling λ' is considered and various possible R-parity violating decays and gauge decays of the squarks are taken into account. Such couplings could lead in particular to leptoquark-like final states or to explicit manifestation of lepton number violation. The sensitivity to λ' is shown to be only weakly dependent on the free parameters of the Minimal Supersymmetric Standard Model and the reach in the mass-coupling plane extends to domains unexplored in other direct or indirect searches. Squarks could naturally have a low decay branching ratio into a e^+-quark pair and thus partly avoid severe leptoquark-like constraints from the Tevatron.