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Measuring Lepton Flavour Violation at LHC with Long-Lived Slepton in the Coannihilation Region

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When the mass difference between the lightest slepton, the NLSP, and the lightest neutralino, the LSP, is smaller
than the tau mass, the lifetime of the lightest slepton increases in many orders of magnitude with respect to typical
lifetimes of other supersymmetric particles. These small mass differences are possible in the MSSM and, for instance,
they correspond to the coannihilation region of the CMSSM for $M_{1/2}$
$gsim$700 GeV.
In a general gravity-mediated MSSM, where the lightest supersymmetric particle is the neutralino,
the lifetime of the lightest slepton is inversely proportional to the square of the intergenerational mixing in the
slepton mass matrices. Such a long-lived slepton would produce a distinctive signature at LHC and a measurement
of its lifetime would be relatively simple. Therefore, the long-lived slepton scenario offers an excellent opportunity
to study lepton flavour violation at ATLAS and CMS detectors in the LHC and an improvement of the leptonic mass
insertion bounds by more than five orders of magnitude would be possible.

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