

SEMINARIO DEL DEPARTAMENTO DE FÍSICA TEÓRICA

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Flavour Violation in Non-Minimal Supersymmetric Models

Benjamin Fuks
IPHC, Strasbourg

Abstract: In non-minimal supersymmetric models, novel effects of flavour violation may occur. In this seminar, we will investigate two different cases: (i) the flavour structure in the squark sector cannot be directly deduced from the trilinear Yukawa couplings of the fermion and Higgs supermultiplets and is derived from totally new sources; (ii) R-parity violating terms in the superpotential induce new flavour-violating interactions.

We establish the parameter space regions allowed/favoured by low-energy, electroweak precision, and cosmological data, and define several allowed supersymmetry-breaking scenarios. We present then the cross sections for SUSY particle production processes and study their dependence on the flavour-violating parameters.

Finally, we show the recent progress made in the prospects of a complete automatized Monte Carlo simulation for non-minimal supersymmetric scenarios. We start from a straightforward implementation of the model in the package FeynRules and pursue with the production of fully simulated events, including parton showering, hadronization and LHC-like detector effects.