Motivation

- Supersymmetry: extension of the Standard Model
- Predicts gauginos, fermionic partners of gauge bosons.
- Masses: depends on mechanism of supersymmetry breaking.

Rare Meson Decays To Very Light Neutralinos

What Can Mesons Tell Us About Supersymmetry?

- PDG: $m_{\tilde{\chi}_1^0} > 46$ GeV
- Assumes simple grand unification
- Drop assumption $\Rightarrow$ no lower bound on $m_{\tilde{\chi}_1^0}$

This section presents work in collaboration with H. K. Dreiner (Bonn), S. Grab (Bonn at the time), D. Koschade (Aachen at the time), M. Kramar (Aachen) and U. Langenfeld (Bonn at the time), published in Phys. Rev. D 80 (2009) 035018 [arXiv:0905.2051 [hep-ph]].

Overview

- No "helicity flip" suppression.
- BNL experimental measurement of $K^\rightarrow \pi^+\pi^-\chi_{10}^0$ invisible consistent (with 100% error bars) with SM branching ratio to pion plus neutrinos.

Exploration Of LHC Signals For Non-Universal Gaugino Masses

Varying the gaugino masses can produce quite differing signals at the LHC, such as relative numbers of leptons and jets, how hard the leptons and jets are, and the shape of their invariant mass distributions. This work is being performed in conjunction with theorists and experimentalists in both Aachen and Bonn (H. Dreiner, M. Krämer, K. Desch, P. Wienenmann, J. Lindert).