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DM with supersymmetric triplets

mercredi 4 juin 2014 15:00 (30 minutes)

The Triplet extension of the MSSM (TMSSM) alleviates the little hierarchy problem and provides a significant enhancement of the loop-induced diphoton rate of the lightest CP-even Higgs h . In this I will present the first computation of the h into $Z + \gamma$ decay. I will show that the rates of loop-induced decays are correlated and their signal strengths can rise up to 40% - 60% depending on the channel. I will furthermore study the dark matter phenomenology of the TMSSM. The lightest neutralino is a good dark matter candidate in two regions. The first one is related to the Higgs and Z resonances and the LSP is mostly Bino. The second one is achieved for a mass larger than 90 GeV and the LSP behaves as the well-tempered neutralino. An advantage of the triplet contribution is that the well-tempered neutralino can be a Bino-Triplino mixture, relieving the problem of achieving $M_2 \sim M_1$ in unified scenarios. The dark matter constraints strongly affect the Higgs phenomenology, reducing the potential enhancements of the diphoton and of the $Z + \gamma$ channels by 20% at most. In the near future, complementarity of dark matter direct searches and collider experiments will be crucial to probe most of the parameter space where the neutralino is the dark matter candidate.

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Classification de Session: Dark Universe