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TeV scale Mirage Mediation in the NMSSM

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We study the next-to-minimal supersymmetric standard model.
We consider soft supersymmetry breaking parameters, which are induced by the mirage mediation mechanism of supersymmetry breaking. We concentrate on the mirage mediation, where the so-called mirage scale is the TeV scale. In this scenario, we can realize the effective mu-term
the up-type Higgs soft mass of O(200) GeV, while other masses such as
gaugino masses and stop masses are heavy such as 1 TeV or more.
Cancellation between the effective mu-term and the down-type Higgs soft mass ameliorates
the fine-tuning in the electroweak symmetry breaking even for mu=O(500) GeV.
The lightest Higgs mass can be $115-130$ GeV. The higgsino and singlino are light and their linear combination is the lightest superparticle. We also discuss the new false vacua in the Higgs potential.
The significant parameter region can be excluded by requiring the realistic vacuum to be deeper
than false vacua and the couplings to be perturbative up to the GUT scale, which result in constraints
on the properties of the lightest Higgs boson.

Primary author: Dr SHIMOMURA, Takashi (Niigata Univ., Japan/MPIK, Germany)

Co-authors: Mr MAKINO, Hiroki (Kyushu Univ., Japan); Prof. OKUMURA, Ken-ichi (Kyushu Univ., Japan); Prof. KOBAYASHI, Tatsuo (Kyoto Univ., Japan)

Presenter: Dr SHIMOMURA, Takashi (Niigata Univ., Japan/MPIK, Germany)

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