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Forward-Backward $t\bar{t}$ Asymmetry from Anomalous Stop Pair Production

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We analyse a simple Standard Model (SM) extension with only two new light fields: a scalar partner of the top (stop) (with mass above m_t) and a light neutral fermion χ^0 (with mass of a few GeV), coupled to SM quarks via a Yukawa interaction. We show that such model can lead to a significant enhancement of the forward-backward asymmetry in $t\bar{t}$ production at the Tevatron via the additional $t\bar{t}$ pairs produced from (stop anti-stop) decays. The model satisfies existing constraints on new-physics searches both at low and high energies, and could even address the cosmological dark-matter abundance. The implications for future searches at the LHC are briefly outlined.

Author: Dr KAMENIK, Jernej (Jozef Stefan Institute)

Co-author: Prof. ISIDORI, Gino (INFN Frascati)

Presenter: Dr KAMENIK, Jernej (Jozef Stefan Institute)

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