Wino LSP Dark Matter and PAMELA/Fermi excesses

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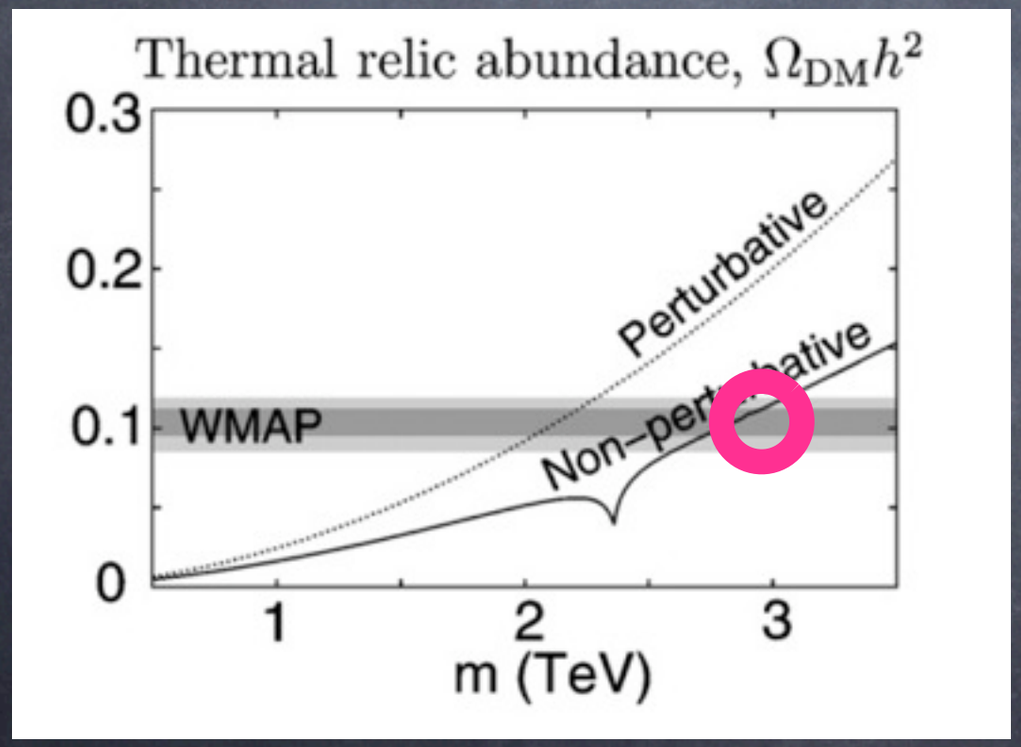
with S. Shirai and T. Yanagida, 0905.0388, PLB680, 435 (2009)



Hisano et al (`07)

$$m_{\tilde{W}} \sim (2.7 - 3)\,\mathrm{TeV}$$

Anomaly mediation

Gravitino mass (= 10^3TeV)

The constant term breaks a continuous U(1)R symmetry down to the Z_2 symmetry (R parity).

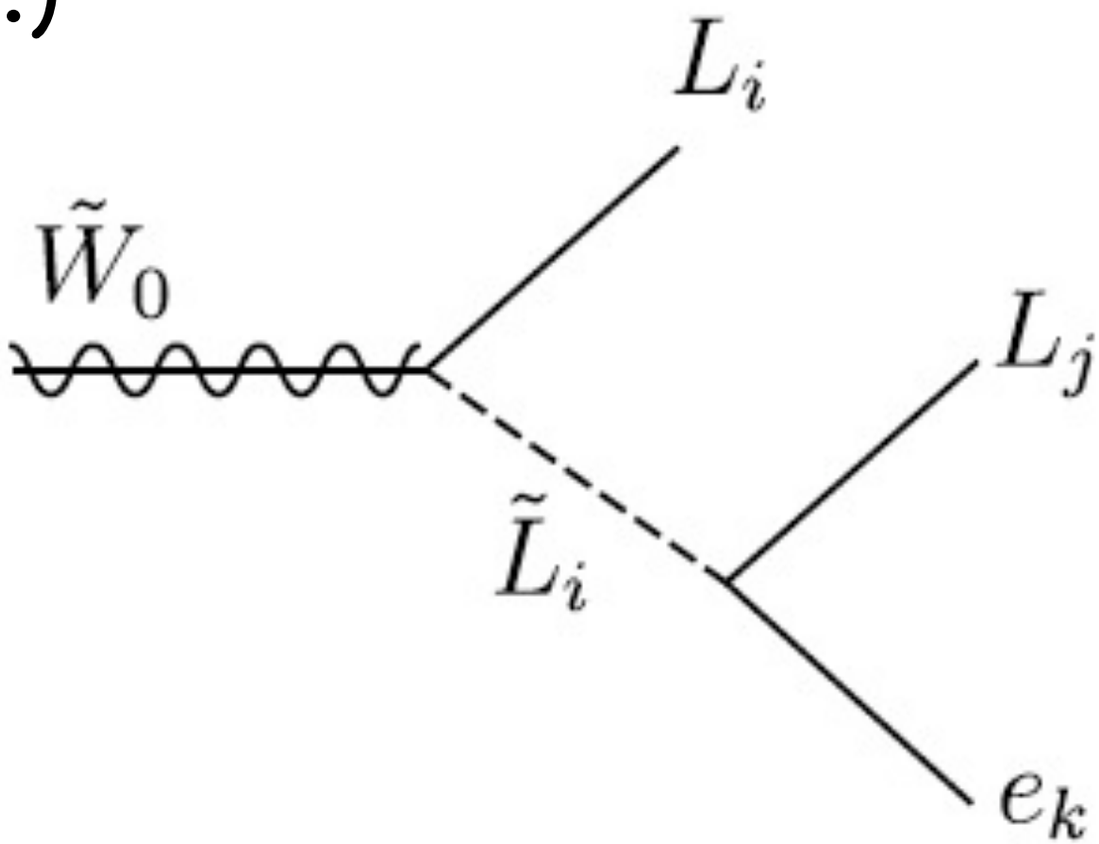
$$W \supset C_0 = m_{3/2} M_P^2$$

If the R symmetry in the high energy is a discrete one (e.g. Z_{2k+1}), the R parity is broken by C_0.

As an example, let us consider the case of k = 2, namely, Z_5 R symmetry.

In our model, the Wino DM of mass 3TeV is not absolutely stable, and decays through the R-parity violating operator, eLL.

e.g.)



$$\Gamma \sim (10^{27}\text{sec})^{-1}\,\kappa^2 \left(\frac{m_{3/2}}{10^3\ \text{TeV}}\right)^4 \left(\frac{m_{\widetilde{W}^0}}{3\ \text{TeV}}\right)^5 \left(\frac{m_{\tilde{\ell}}}{5\,\text{TeV}}\right)^{-4},$$