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Dirac Gauginos and the Di-Photon Excess

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Supersymmetric models with Dirac masses for the gauginos have both a solid top-down theoretical motivation and a rich phenomenology. We show that the 750 GeV di-photon excess can be explained by the Minimal Dirac Gaugino Supersymmetric Standard Model without introducing any additional "ad-hoc" states. In this model, the resonance is identified with the scalar partner of the Dirac bino. We demonstrate that the 750 GeV excess can be achieved in this model while satisfying constraints arising from the scalar mixing with the Higgs boson, vacuum stability, gauge coupling unification and perturbativity of the couplings up to the GUT scale. Considering different benchmark scenarios, we will present how this model is able to produce the intriguing 750 GeV di-photon signature.

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