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Gaugino Masses at 100 TeV

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We discuss prospects of studying supersymmetric model at future pp circular collider (FCC) with its centre-of-mass energy of ~ 100 TeV. We pay particular attention to the model in which Wino is lighter than other supersymmetric particles and all the gauginos are within the kinematical reach of the FCC, which is the case in a large class of so-called pure gravity mediation model based on anomaly mediated supersymmetry breaking. In such a class of model, charged Wino becomes long-lived with its decay length of ~ 6 cm, and the charged Wino tracks may be identified in particular by the inner pixel detector; the charged Wino tracks can be used not only for the discrimination of standard model backgrounds but also for the event reconstructions. We show that precise determinations of the Bino, Wino, and gluino masses are possible at the FCC. For such measurements, information about the charged Wino tracks, including the one about the velocity of the charged Wino using the time of the hit at the pixel detector, is crucial. With the measurements of the gaugino masses in the pure gravity mediation model, we have an access to more fundamental parameters like the gravitino mass.

This study has been submitted to JHEP (arXiv:1901.10389).

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