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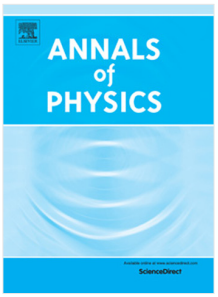

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Localization of Gravitino Field on Branes

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In this paper, we investigate the localization of a bulk gravitino field on the scalar-tensor branes and compare the result with that in the Randall-Sundrum-1 (RS1) model. The coupled chiral equations for the Kaluza-Klein (KK) modes of the gravitino field are obtained by fixing the gauge $\Psi_5 = 0$ and using the chiral KK decompositions. It is shown that, in the RS1 model for the left- and right-handed zero modes of the gravitino field, only one of them can be localized near one brane. For the massive modes, both chiral modes survive and the lower KK modes are localized near the IR brane from the four-dimensional physical coordinate point of view. However, for the scalar-tensor brane model, the localization of the gravitino chiral zero modes depends on the coupling parameter λ, and they will be not localized around anyone brane within a certain range of the parameter λ, which is quite different from the RS1 model. Furthermore, we also give the corresponding mass spectra of the massive KK gravitinos in the scalar-tensor model.

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