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The Higgs-radion scenario: a new candidate for the 126 GeV state

We investigate a Randall-Sundrum model with an SU(2) doublet propagating in the bulk. Upon calculating its gravitational effect we find that a stabilized radius can be generated without the use of an additional scalar, as needed for example in the Goldberger-Wise (GW) mechanism, and with no additional fine-tuning other than the inescapable one due to the cosmological constant; similar tuning is also present in the GW mechanism. The lowest scalar excitation in this scenario, the counterpart of the radion of the GW mechanism, has both radion-like and Higgs-like couplings to the SM fields. It, thus, plays a dual role and we, therefore, denote it as the “Higgs-radion” (hr). As opposed to the GW radion case, our Higgs-radion is found to be compatible with the 126 GeV scalar recently discovered at the LHC, at the level of 1σ , with a resulting 95% CL bound on the KK-gluon mass of: $4.48 \text{ TeV} < M_{KKG} < 5.44 \text{ TeV}$.

Summary

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