

Electroweak phase transition in a non-abelian vector dark matter scenario

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We study a scenario where the Standard Model is extended by a $SU(2)$ gauge group in the dark sector. The three associated dark gauge bosons are stabilised via a custodial symmetry triggered by an additional dark $SU(2)$ scalar doublet, thus making them viable dark-matter candidates. After considering the most recent constraints for this model, we analyse the phase transition dynamics and compute the power spectrum of resulting stochastic gravitational-wave background. Finally, we find regions of the parameter space yielding the observed dark-matter relic density while also leading to strong enough phase transition with an associated gravitational-wave signal reaching the sensitivity of future space-based gravitational-wave detector, such as LISA, DECIGO, BBO, TianQin or Taiji.

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