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Constraining the Higgs in the GM model

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Here, we investigate the parameter space of the Georgi-Machacek (GM) model in both cases where the extra CP-even scalar could be lighter or heavier than the Higgs. We consider many theoretical and experimental constraints, in addition to the constraints from doubly charged Higgs bosons and Drell-Yan di-photon production and the indirect constraint from the $b \rightarrow s$ transition processes. We found that some unwanted wrong minima that may violate the CP and/or the electric charge symmetries; are possible. This excludes about 75 % of the parameter space. In addition, negative heavy resonance searches exclude a significant part of the viable parameter space.

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