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Constraining Secluded Dark Matter Scenarios with HAWC

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It is possible that DM particles are secluded to their own dark sector, where the interactions are carried by one or several dark mediators. If this dark sector exists, DM particles do not couple directly to the standard model (SM) particles, as in the case of WIMP scenarios. However, indirect DM searches are still possible if we assume that dark mediators are coupled to SM particles through a kinetic mixing parameter. The HAWC Observatory is a wide-field-of-view gamma-ray experiment with a high duty cycle ($>95\%$) and looking for gamma rays with energies between 1 and 100 TeV. So, for secluded DM candidates in the TeV range, the HAWC Observatory is able to explore and constrain the parameter space of dark sector scenarios by searching for gamma-ray signals of dark mediator decays in nearby astrophysical targets. Here, we present preliminary results of these indirect searches using HAWC data.

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