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Combined search in dwarf spheroidal galaxies for branon dark matter annihilation signatures with the MAGIC Telescopes

One of the most pressing questions for modern physics is the nature of dark matter (DM). Several efforts have been made to model this elusive kind of matter. The largest fraction of DM cannot be made of any of the known particles of the Standard Model (SM). We focus on brane world theory as a prospective framework for DM candidates beyond the SM of particle physics. The new degrees of freedom that appear in flexible brane world models, corresponding to brane fluctuations, are called branons. They behave as weakly interacting massive particles (WIMPs), which are one of the most favored candidates for DM. We present a multi-target DM search in dwarf spheroidal galaxies for branon DM annihilation signatures with the ground-based gamma-ray telescope MAGIC leading to the most constraining branon DM limits in the multi-TeV mass range.

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