

Search for Inelastic Dark Matter with a Dark Higgs at Belle II

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Belle II has a unique reach for a broad class of models that postulate the existence of dark matter particles in the MeV-GeV mass range. One highly motivated scenario is a model which involves inelastic dark matter, consisting of two dark matter states with a mass splitting between them and the presence of a dark Higgs boson. This model has a signature of up to two displaced vertices, one from the resonant decay of the dark Higgs and another non-resonant one emerging from the decay of the involved dark matter particles. This talk will present studies of an ongoing search for such signatures using Belle II simulation, which is not only challenging due to the presence of displaced vertices but also because of the seven-dimensional parameter space of the model.

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