Abstract

The nature of dark matter remains one of the biggest open questions in particle physics. A broad-reaching program of searches for dark matter, as well as studies of its properties, has proceeded over the last few decades, but there remain dark matter candidates that would be missed by existing strategies. I present three models of dark matter that would have interesting new signals at current and near-future neutrino experiments, yet are not constrained by current searches. The first is boosted dark matter, in which there is small, but observable flux of dark matter traveling at much larger velocities than the dominant component making up our galaxy. I then discuss a Higgs portal mediator to the dark sector that could be produced in intense proton beams and detected in short baseline experiments. Finally, I consider a model of macroscopic dark matter that undergoes nuclear radiative capture at several points during its passage through a large detector. In all three cases, I present calculations of the expected sensitivity to the model.