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Potential for discovery of a new dark matter WIMP at the High-Luminosity Large Hadron Collider or the Compact Linear Collider SABRINA HERNANDEZ, SPENCER ELLIS, BRANDON TORRES, TREVOR CROTEAU, BAILEY TALLMAN, CADEN LAFONTAINE, DIEGO CRISTAN-CHO GUERRERO, ROLAND ALLEN, Texas A&M University — We propose a new dark matter WIMP, for which the best prospect for collider discovery appears to be vector boson fusion. Since this is a 4-vertex process with a very small crosssection (which we estimate to be ~ 1 femtobarn), it appears that detection of this particle is likely to require a new collider with greater reach than the present LHC – either the High-Luminosity LHC or the Compact Linear Collider (CLIC). We will discuss the plans for these new colliders and how the particle proposed here can be observed, via missing transverse energy of ~ 150 GeV resulting from W and Z fusion. We will also describe the very favorable features of this dark matter candidate, which is consistent with all current experimental limits, but within reach of several experiments that are planned for the near or foreseeable future. The present theory is consistent with supersymmetry, although the dark matter particle itself does not require susy.

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