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Neutrino masses and Dark Matter from TeV-scale dark confinement

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The smallness of neutrino masses in the inverse seesaw mechanism arises due to the interplay of TeV-scale Pseudo-Dirac mass terms and a small explicit breaking of lepton number. Here we propose to use dynamical symmetry breaking from a confining dark non-abelian symmetry to explain such a small lepton-number breaking mass. We couple a single generation of vector-like dark quarks, transforming under a $\mathrm{SU}(3)_{\mathrm{D}}$ gauge symmetry, to a real singlet scalar, which communicates the dark quark condensate to three generations of heavy neutrinos. The lightest dark baryon is stabilized at the renormalizable level by an accidental dark baryon number symmetry and can account for the observed relic density. This model may be probed by next generation neutrino telescopes via neutrino lines produced from dark matter annihilations.

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