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Scalar Dark Earth-Shine ADAM GREEN[1], FLIP TANEDO[2], Univ of California - Riverside — Dark matter may interact with itself and with ordinary matter through new forces with new mediator particles. We extend the work of a recent study of the dark photon mediator to a spin-0 scalar mediator, the dark Higgs. In this scenario, dark matter collects in the center of the earth and annihilates into these mediators which could decay into detectible particles near the surface of the Earth. In the annihilation rate, we include Sommerfeld enhancements, which play a critical role in decreasing the timescale for the capture-annihilation process to equilibrate. We also highlight the importance of the s-wave 2-to-4 annihilation in the dark Higgs model, as opposed to the s-wave 2-to-2 annihilation in the dark photon model. This search may compliment the dark photon search by allowing for a broader distribution of signal events which point back towards the center of the earth.

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