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Cancel: [YSF] Electroweak Symmetric Dark Matter Balls

We show that a simple Higgs-portal dark matter model can contain stable non-topological soliton states of dark matter. This macroscopic dark matter candidate has its interior in an electroweak symmetry unbroken vacuum. These dark matter balls can have its radius around the atomic scale and mass as large as 10^{34} GeV. We discuss the formation of these dark matter balls from the first-order electroweak phase transition in the early universe. We describe the existence of bound states of standard model particles inside the dark matter balls and its scattering off from normal matter such as heavy nuclei, quarks or even an electron. Such dark matter candidates can be searched in a wide range of experiments. We provide constraints from the WIMP-like direct detection and also from multi scatter events.

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