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Quark nugget models of dark matter revisited

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We revisit models of quark matter as possible candidates for dark matter. In these models, dark matter may consist of compact composite objects of dense quark (or antiquark) matter which we refer to as the quark nuggets (QN). We focus on the properties of the electron (or positron) cloud around the QN core, because it may play a crucial role in dark matter detection experiments. In particular, we study the electron (or positron) density distribution, electron-positron annihilation, photon absorption length and thermal radiation in the electron (or positron) cloud. We also discuss the quark-antiquark annihilation of ordinary matter in the QN core and its products. These processes specify the radiation spectrum from the quark nuggets in space and when they hit the Earth and possibilities of QN detection.

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