Self-gravitating system made of axions

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We show that the inclusion of an axion-like effective potential in the construction of a self-gravitating system made of scalar fields leads to a decrease on its compactness when the value of th self-interaction coupling constant is increased. By including the current values for the axion mass m and decay constant f_a, we have computed the mass and the radius for self-gravitating systems made of axion particles. It is found that such objects will have asteroid-size masses and radius of few meters, then, the self-gravitating system made of axions could play the role of scalar mini-machos that are mimicking a cold dark matter model for the galactic halo.

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