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# WIMP capture for dark stars in the early universe

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The first stars to form in the universe may have been Dark Stars, powered by dark matter annihilation instead of nuclear fusion. The initial amount of dark matter gathered by the star gravitationally can sustain it only for a limited period of time. It has been suggested that capture of additional dark matter from the environment can substantially prolong the dark star phase and the star's life time. In analyzing the capture process in detail one however finds that it is very hard for the dark star to sustain high capture rates for an extended period of time. The star's WIMP capture rapidly depletes the population of WIMPs that is easy for the star to capture, resulting in such a large drop in the WIMP capture rate that it can no longer sustain the dark star.

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