

Melting domain walls for Pulsar timing arrays

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We discuss cosmic domain walls described by a tension redshifting with the expansion of the Universe. These melting domain walls emit gravitational waves with the low-frequency spectral shape corresponding to the spectral index $\gamma=3$ favored by the recent Pulsar timing data. We discuss a concrete high-energy physics scenario leading to such a melting domain wall network in the early Universe. This scenario involves a feebly coupled scalar field, which can serve as a promising dark matter candidate. We identify parameters of the model that match the gravitational wave characteristics observed in the Pulsar timing data. The dark matter mass is pushed to the ultralight range accessible through planned observations thanks to the effects of the superradiance of rotating black holes.

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