

NANOGrav spectral index $\gamma=3$ from melting domain walls

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I will discuss cosmic domain walls with the tension which red-shifts with the expansion of the Universe. These melting domain walls emit gravitational waves (GW) with the low-frequency spectral shape corresponding to the spectral index favoured by the recent NANOGrav 15 yrs data. I will discuss a concrete high-energy physics scenario, which leads to such a melting domain wall network in the early Universe. The scenario involves a feebly coupled scalar field, which can serve as a promising dark matter candidate. We identify parameters of the model matching the GW characteristics observed in the NANOGrav data. The dark matter mass is pushed to the ultra-light range, which is accessible through planned observations thanks to the effects of superradiance of rotating black holes.

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