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Hellings-Downs curve deformed by ultralight vector dark matter

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Pulsar timing arrays (PTAs) provide a way to detect gravitational waves (GWs) at nanohertz frequencies. To ensure the detection of GWs, observational data must exhibit the Hellings-Downs angular correlation. It is also known that PTAs can probe ultralight dark matter. In this talk, we consider possible contamination of the Hellings-Downs angular correlation by the ultralight dark matter. We will show that ultralight vector dark matter can give rise to the deformation of the Hellings-Downs correlation curve. Thus, the Hellings-Downs correlation curve could contain information on ultralight dark matter with a spin.

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