

A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

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The accretion of dark matter (DM) into astrophysical black holes slowly increases their mass, and this mass accretion depends on DM models and model parameters. If this mass accretion effect can be measured accurately enough, it is possible to rule out some DM models, and, with the sufficient technology and the help of other DM constraints, possibly confirm one model. We propose a DM probe based on accreting pulsar-black hole binaries, which provides a high-precision measurement on binary orbital phase shifts induced by DM accretion into black holes, can help rule out DM models and study the nature of DM.

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