Contribution ID: **48** Type: 口頭発表

Reevaluation of Gravitational Waves from Metastable Cosmic String Segments

Thursday, September 4, 2025 10:00 AM (30 minutes)

Recent pulsar timing array experiments have reported signals of a stochastic gravitational wave background. If metastable cosmic strings, which can explain this observation well, truly exist, they could serve as compelling evidence for physics beyond the Standard Model. Metastable cosmic strings form structures known as segments, which consist of cosmic strings connecting monopole–antimonopole pairs. In previous studies, gravitational waves from such segments have been treated in a conventional manner lacking a solid physical basis. In this study, we re-evaluate the dynamics of these segments and clarify the appropriate method for evaluating the resulting gravitational waves.

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