



東工大 物理学系「物理学リーダーシップ」

FGIP : Foreign Graduate Student Invitation Program

外国人博士課程大学院生の短期招待・共同研究

FGIP - Student Forum セミナー

Josu C. Aurrekoetxea (King's College London, UK)

日時 : 2020年3月3日(火) 16:00 - 17:30, 場所 : H155B

Coherent Gravitational Waveforms and Memory from Cosmic String Loops

Abstract:

We construct, for the first time, the time-domain gravitational wave strain waveform from the collapse of a strongly gravitating Abelian Higgs cosmic string loop in full general relativity. We show that the strain exhibits a large memory effect during merger, ending with a burst and characteristic ringdown as a black hole is formed. Furthermore, we investigate the waveform and energy emitted as a function of width, radius and string tension $G\mu$. We find that the mass normalized gravitational wave energy displays a strong dependence on the inverse of the string tension $E_{GW} / M_0 \propto 1/G\mu$, with $E_{GW} / M_0 \sim O(1)\%$ at the percent level, for the regime where $G\mu \ll 1e-3$. Conversely, we show that the efficiency is only weakly dependent on the initial string width and initial string radii. Using these results, we argue that gravitational wave production is dominated by kinematical instead of geometrical considerations.



FGIP - Guest student の滞在スケジュール

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滞在期間 : 2020年2月27日 - 2020年3月27日 受入担当 : Fabio Chibana (山口研)

<http://www.phys.titech.ac.jp/leadership/fgip/index.html>

FGIP Student Forum 事務局