中華民國天文學會
The Astronomical Society of the Republic of China (Taiwan)

Contribution ID: **104** Type: **Poster**

In search of gravitational waves from fast X-ray transients

Fast X-ray Transients (FXTs) are brief, intense X-ray flashes unassociated with persistent X-ray sources or known stellar objects, typically lasting from seconds to hours. Previous studies have identified the origins of some FXTs, e.g., XRO 080109/SN2008D as supernova shock breakouts and EP240315a as long-duration Gamma Ray Bursts. In the past 4 decades, a portion of FXTs have been identified as Gamma-Ray Bursts (GRBs). However, the origins of the rest of the FXTs remain uncertain, prompting the development of theoretical models, including binary neutron star mergers, accretion-induced collapse of compact objects and Tidal disruption events.

With the launch of Einstein Probe in January 2024, the study of FXTs has entered a new phase. Its large field of view significantly increases the discovery rate, enabling a more robust statistical analysis. As of April 2025, Einstein Probe has reported approximately 80 FXTs —about four times the 22 events identified by Chandra between 2000 and 2022.

We propose a methodology to search for possible relations between Gravitational Waves and FXTs. To achieve this, we intend to utilize X-Pipeline, an unmodeled search algorithm to identify excess coherent signals in LIGO-Virgo-KAGRA (LVK) O4 observations. By applying minimal assumptions, the search aims to test the existence of any temporal and spatial correlation, which may provide new insights into the physical mechanisms driving these transient X-ray events.

Section

High Energy

Primary author: WANG, Po-Ya (NTHU)

Co-authors: KONG, Albert (NTHU); SAHA, Surojit (Institute of Astronomy, National Tsing Hua University, Taiwan)

Presenter: WANG, Po-Ya (NTHU)

Session Classification: Poster-GW