Contribution ID: **35** Type: **Poster**

Accessing explosion properties in a core-collapse supernova through the star's emission regions.

Monday 21 July 2025 16:30 (2 minutes)

Core-collapse supernovae are exploding massive stars and the next Galactic event will be one of the most interesting astronomical events of the century. After the collapse of a star's core, a so-called proto-neutron star (PNS) is formed, heating the star from the inside and creating a shock wave. It is believed that the majority of the gravitational-wave (GW) emission comes from PNS. The GW signals from the recent three-dimensional numerical core-collapse supernova simulations (Murphy et al 2025, arXiv:2503.06406) can be divided into a few signals corresponding to the star's regions. In this project, we analyze the GW signatures and study whether it's possible to distinguish these regions based on a GW. We will utilize real LIGO-Virgo-KAGRA noise and model-independent coherent WaveBurst to study the detectability in case of a discovery of GWs.

Primary authors: PADHI, Brajesh Kumar (IISER THIRUVANANTHAPURAM); SZCZEPANCZYK, Marek (University of Warsaw)

Presenter: PADHI, Brajesh Kumar (IISER THIRUVANANTHAPURAM)

Session Classification: Poster Sparkler