ID contributo: **3** Tipo: **non specificato**

A deep learning approach to detect gravitational waves from binary close encounters

Gravitational wave (GW) emission from close encounters (CEs) between neutron stars (NSs) and/or black holes (BHs) binary are recently being considered as new potential astrophysical sources for ground-based detectors. CEs are mostly part of three-body systems, constrained by a dense stellar environment. Their GW emission is the result of a dynamical capture, whose waveform is hard to model with respect to quasi-circular isolated inspiral binary systems, already observed by the LIGO/Virgo collaboration. Unmodeled burst search could be a viable method for detecting such systems in data from Advanced LIGO and Virgo observing runs. We propose a deep learning-based approach for CE detection, based on pipeline using convolutional neural networks capable of detecting transient signals associated to CEs. The training of the algorithm is based on simulated timeseries of LIGO and Virgo data, superimposed to stationary-Gaussian background noise. We present preliminary results on the performance of this algorithm, using a one-dimension convolutional neural network, with the ultimate goal of applying to real data.

Autore principale: Sig. SORRENTINO, Nunziato (University of Pisa and INFN-Pisa)

Coautore: Prof. RAZZANO, Massimiliano (University of Pisa and INFN-Pisa)

Relatore: Sig. SORRENTINO, Nunziato (University of Pisa and INFN-Pisa)