MNRAS **000**, 1–1 (2018) Preprint 7 September 2018 Compiled using MNRAS LATEX style file v3.0

Automatic classification of oscillation modes from core-collapse supernova simulations.

Melissa Lopez,[1] Alejandro Torres-Forné,[2⋆] Pablo Cerdá-Durán,[3] and José A. Font[3,4]

[1] *Afiliacion de Melissa*
[2] *Max Planck Institute für Gravitationalphysik (Albert Einstein Institute), D-14476 Potsdam-Golm, Germany*
[3] *Departamento de Astronomía y Astrofísica, Universitat de València, c/ Dr. Moliner, 50, Burjassot (Valencia) E46100, Spain.*
[4] *Observatori Astronòmic, Universitat de València, C/ Catedrático José Beltrán 2, 46980, Paterna (València), Spain.*

Accepted XXX. Received YYY; in original form ZZZ

ABSTRACT
TBA

Key words: asteroseismology – gravitational waves – methods: numerical – stars: neutron – stars: oscillations – supernovae: general

1 INTRODUCTION

A brief summary of the deteccion of GW and the problem of SNCC data analysis compared with BBH

1.1 Core-collapse simulation

A brief summary of the CC simulation used in this paper (Martin and Pablo), code used, parameters of the progenitor, etc...

1.2 Mode analysis scheme

A brief summary of the mode analysis scheme with and without the cowling approximation. It should be a summary of our 2 previous papers. Also a description of the classification methods and its main drawback that justify this paper.

2 CLASSIFICATION METHODS

Description of the methods used.

2.1 K-means

2.2 Gaussian Mixture

3 HYPERPARAMETERS TUNNING

Description of the different hyperparameters of the classification methods and how we have tuned them to get the better results.

4 RESULTS

Results using both methods for the two simulations (Martin and Pablo) with the versions with both methods (8 results in total).

4.1 K-means

4.2 Gaussian Mixture

I

5 SUMMARY

Summary and future work

This paper has been typeset from a TEX/LATEX file prepared by the author.

⋆ E-mail: alejandro.torres@uv.es