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Searching tidally disrupted white dwarfs to find intermediate mass black holes

My poster is focused on two topics. The main one is related to intermediate mass black holes (IMBHs). Some recent observations suggest that IMBHs exist in our Universe. Yet, none of them has been confirmed so far. A possible way to prove the existence of these elusive objects can be the study of tidal disruption events of white dwarfs (WDs). Indeed, if a WD wanders too close to an IMBH, it gets tidally disrupted, producing a gravitational wave (GW) burst with a frequency around the decihertz. Anyway, this signal is not very strong and decreases quickly with distance, so it is unlikely that the future space interferometers will be able to detect it. For this reason, it is more significant to study the GW background associated to this type of source, taking into account that the natural environment for these holes are globular clusters and, since there are many globular clusters per galaxy, we expect many sources of this type through all the Universe. We derive this background for different values of the parameters involved in the problem and we compare our estimates with the sensitivity curves of the deci-hertz interferometers LISA, TianQin, ALIA and DECIGO. The second part of my poster instead will describe GR-PHANTOM, a 3D general relativistic smoothed particle hydrodynamics code, where I have implemented a feature for the calculation of the gravitational wave signal emitted by a source. Thus, this code could be an useful tool to study astrophysical events that produce both electromagnetic and gravitational signals.

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