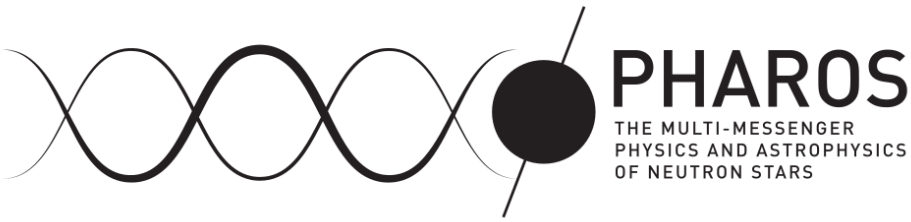

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The role of mass, equation of state and superfluid reservoir in pulsar glitches

Thursday 27 September 2018 09:50 (20 minutes)

In the interior of a mature neutron star, the differential rotation of the neutron superfluid star with respect to the normal component allows to store angular momentum, which is released during a pulsar glitch. Recent preliminary studies show how it is in principle possible to estimate pulsar masses from observations related to their timing properties. In this talk we will present a generalisation of a previous model for the stratified reservoir of a neutron star when describing glitches, by examining the possibility of different extensions of the S-wave superfluid domain. In particular, we study the dependence of the glitcher's mass inferred within this model on the still uncertain extension of the region in which the ${}^1S_0$ neutron pairing gap is big enough to allow for superfluity. Hence, we can quantify the general expected trend that to a smaller extension of the ${}^1S_0$ pairing channel's region should correspond a smaller mass estimate. The employment of different equations of state for the star matter does not affect the general tendency described above: future independent estimates of masses of a couple of objects in our sample has the potential to calibrate our results and put indirect constraints on the microphysics of neutron stars.

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