

Stability and instability of strange dwarfs

More than 20 years ago, Glendenning et al. (1995) proposed the existence of stable white dwarfs with a core of strange quark matter. More recently, by studying radial modes, Alford et al. (2017) concluded that those objects are unstable. We investigate again the stability of these objects by looking at their radial oscillations, and we assume that there is no phase transition between hadronic and quark matter at the strange core interface, following the formalism developed by Pereira et al. (2018) and Di Clemente et al. (2020). Our analysis shows that if the star is not strongly perturbed and ordinary matter cannot transform into strange quark matter, this type of objects are indeed stable. On the other hand, ordinary matter can be transformed into strange quark matter if the star undergoes a violent process, as in the early stages of a supernova, causing the system to become unstable (as described by Alford et al. (2017)) and collapse into a strange quark star. In this way, km-sized objects with subsolar masses can be produced.

Di Clemente, Drago, Pagliara and Char, in preparation.

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Alford, Harris, Sachdeva, ApJ 847 (2017) 109

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Authors: DRAGO, Alessandro; DI CLEMENTE, Francesco (University of Ferrara); CHAR, Prasanta (University of Liege); PAGLIARA, giuseppe

Presenter: DI CLEMENTE, Francesco (University of Ferrara)

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