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Astrosismology revisited under the slow stable hybrid stars hypothesis

In this work, we present recent results related to non-radial modes of compact objects putting particular attention to those related to slow stable hybrid stars (SSHS) that are possible when sharp first order hadron-quark occurs within the slow hadron-quark conversion regime. Moreover, we will review the impact of such objects in the validity of universal relationships known for some fluid and spacetime modes available in the literature. Finally, we show a new universal relationships for the wI-modes that include SSHS, and present potential astronomical applications of such relationships, showing that, if the frequency and damping time of the fundamental wI-mode are measured, the mass, radius, and dimensionless tidal deformability of the pulsating object can be inferred. The errors of such estimates are smaller than a few percent for the mass and radius. For the dimensionless tidal deformability, the errors for compact objects with masses greater than 1.4 solar masses are typically less than 100%.

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