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Slow stable hybrid stars: a new class of compact stars that fulfills all current observational constraints

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We study hybrid stars considering the effects on stellar stability of the hadron-quark conversion speed at the sharp interface. The equation of state is constructed by combining a model-agnostic hadronic description with a constant speed of sound model for quark matter. We show that current LIGO/Virgo, NICER, low-density nuclear and high-density perturbative QCD constraints can be satisfied in two scenarios with low and high transition pressures. If the conversion speed is slow, a new class of hybrid objects is possible and very stiff hadronic equations of state cannot be discarded.

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