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## Special points for hybrid neutron stars in the mass-radius diagram

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We present a systematic investigation of the possible locations for the special point (SP), a unique feature of hybrid neutron stars in the mass-radius diagram. The study is performed within the two-phase approach where the high-density (quark matter) phase is described by the constant-sound-speed (CSS) equation of state (EoS) and the nuclear matter phase around saturation density is varied from very soft (APR) to stiff (DD2 with excluded nucleon volume). Different construction schemes for the deconfinement transition are applied: Maxwell construction, mixed phase construction and parabolic interpolation. We demonstrate for the first time that the SP is invariant not only against changing the nuclear matter EoS, but also against variation of the construction schemes for the phase transition. Since the SP serves as a proxy for the maximum mass and accessible radii of massive hybrid stars, we draw conclusions for the limiting masses and radii of hybrid neutron stars.

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