while successful in reproducing nuclear and astrophysical constraints, suffer from inherent model dependencies in their parametrizations. These dependencies can introduce biases in posterior distributions when constraining neutron star properties from observational data, potentially affecting our interpretation of multi-messenger observations.
Model-independent and agnostic frameworks attempt to overcome these limitations through increased flexibility, but this comes at the cost of reduced physical interpretability and increased systematic uncertainties. The tension between flexibility and physical consistency presents a fundamental challenge: how can we develop EOS models that are both sufficiently flexible to capture diverse astrophysical constraints and physically motivated enough to provide meaningful insights into dense matter?
We present a new framework that addresses these challenges by combining the strengths of both approaches. Our method maintains theoretical consistency while achieving the flexibility necessary for modern astrophysical applications. By carefully constructing a framework that respects fundamental nuclear physics principles without being overly restrictive, we demonstrate improved performance in capturing current observational constraints across the full neutron star mass range.
This work suggests that next-generation EOS modeling can move beyond the traditional dichotomy between phenomenological and agnostic approaches, offering new pathways for leveraging multi-messenger observations to constrain the properties of matter at extreme densities.

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Accretion channels of subcritical X-ray pulsars: a study of hydrodynamics and radiation

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We present the results of self-consistent radiation-hydrodynamic modeling of accretion channels of subcritical X-ray pulsars. The process of resonant Compton scattering and vacuum polarization is taken into account. It is shown that the radiation in the cyclotron line is determined by the hydrodynamic characteristics of the flow in the accretion channel and the position of the cyclotron line centroid has a positive correlation with the plasma deceleration degree, which corresponds to the observational data. In addition, we investigate the polarization of the X-ray radiation outgoing from the accretion channel.
The work of IDM was supported by the Foundation for the Advancement of Theoretical Physics and Mathematics "BASIS"

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Massless Bose Particles -Hions and the Possibilities of Real Space-Time Engineering

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Recently, within the framework of the stochastic Yang-Mills equations for the gauge symmetry group SU(2)xU(1), the possibility of the evidence of massless Bose particles with spin-1- The formation of a