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Stability Conditions for the Horndeski Scalar Field Gravity Model

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We constrain the viable models of Horndeski gravity after the GWs events by resorting to the Witten positive energy theorem. We find that the free function $G3(\phi,X)$ in the Lagrangian is con- strained to be a function solely of the scalar field, $G3(\phi)$. In addition, relations among the free functions are found. Other criteria for stability are also analysed, such as the attractiveness of gravity, and the Dolgov-Kawasacki instability. Some applications for cosmology are discussed.

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