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(G*) The complex symmetron: global strings in non-minimally coupled scalar-tensor theories

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Topological defects, such as monopoles, cosmic strings and domain walls, have been extensively studied in theories with fields minimally coupled to gravity. With the surging interest in alternative gravity theories, it is interesting to investigate the novel characteristics of defects in theories with non-minimally coupled strings. Previous works in this filed have already yielded interesting properties of domain walls in the symmetron model. In this work, we study a generalization of the symmetron model where the scalar field is complex, with the theory allowing for stable global string solutions. We have used the Crank-Nicolson scheme to evolve configurations of strings, loops and matter halos. Our results show, similar to the case of the domain walls in the real symmetron model, the strings become more stable as they attach themselves to matter halos. We also show that consequently a string loop can be become stable as it attaches itself to a distribution of matter halos.

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