Prolate Proca stars

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Abstract

We present a new family of solitonic solutions of the Einstein-(complex) Proca model. They are static and axially symmetric, with an odd-parity electric Proca potential, the surfaces of constant energy density exhibiting a prolate shape. Rather counterintuitive, for a fixed Noether charge, these 'prolate Proca stars' are less massive than the spherical ones. This suggests that the prolate configurations may correspond to the fundamental states, a result confirmed by the full nonlinear evolution.

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