STATIC BOSON STARS IN THE EINSTEIN-FRIEDBERG-LEE-SIRLIN THEORY

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It has been suggested that compact objects composed of scalar fields (which are bosonic) may exist in nature. This type of system is known as boson star (BS) and can be stable, for example, in the case of BSs composed of complex scalar fields. BS solutions were first obtained by physicists David J. Kaup in 1968, and Remo Ruffini along with Silvano Bonazzola in 1969. A pioneer article published In 1976 by R. Friedberg, T. D. Lee and A. Sirlin showed that solitons can emerge in Minkowski spacetime as solutions of complex scalar fields coupled with a real scalar field, which is known as the Friedberg-Lee-Sirlin (FLS) model. The FLS model minimally coupled to gravity gives rise to the Einstein-Friedberg-Lee-Sirlin (E-FLS) theory. In this presentation, we investigate the static boson star solutions in the so-called Einstein-Friedberg-Lee-Sirlin (E-FLS) theory, performing a complete analysis of the solution space in this model. We explore the numerical solution of spherically symmetric configurations in the E-FLS model, which we named as E-FLS stars.