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Astrophysical Q-balls and their gravitational microlensing signature

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Recent developments in dark matter research have spiked investigations into extended configurations within this mysterious sector. Depending on various parameters within the underlying dark matter model, these extended structures may exhibit distinct properties. Furthermore, investigating their gravitational microlensing signature will be instrumental for observational purposes. In my talk, I will elucidate the formation of these extended structures arising from a non-topological soliton configuration known as Q-balls. I will explain in detail the limitations imposed on their sizes and the constraints on underlying parameters, grounded in considerations of gravitational stability and solution viability. Additionally, I will describe their unique gravitational microlensing signatures. Assuming that these astrophysical Q-balls could constitute a minor component of dark matter in the universe, I will establish limits on this fraction using data from gravitational microlensing surveys such as EROS-2, OGLE-IV, HSC-Subaru, and the proposed future survey WFIRST.

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Designation

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