Astrophysics of multi-state fuzzy dark matter

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Short abstract

Going beyond the fuzzy dark matter model, we present the construction of multi-state configurations of the Gross-Pitaevskii-Poisson system that rules the dynamics of this matter, their stability, mechanism of formation and application in galactic astrophysics.

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Questions and approach

Can equilibrium solutions with multi-
    bosons be constructed?

Yes, we build them

Are they stable and can they be formed?

We evolve the configurations using the
    full time-dependent GPP equations and
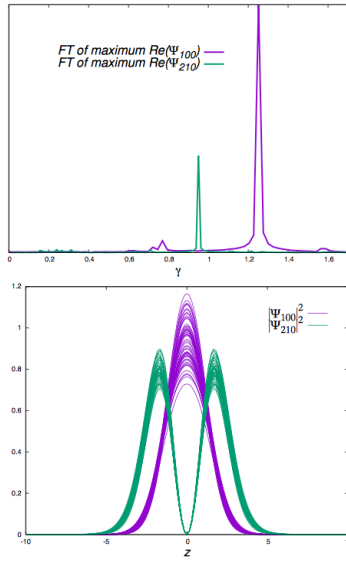   determine they are or are not stable

Are these solutions useful?

They can possibly explain the satellite
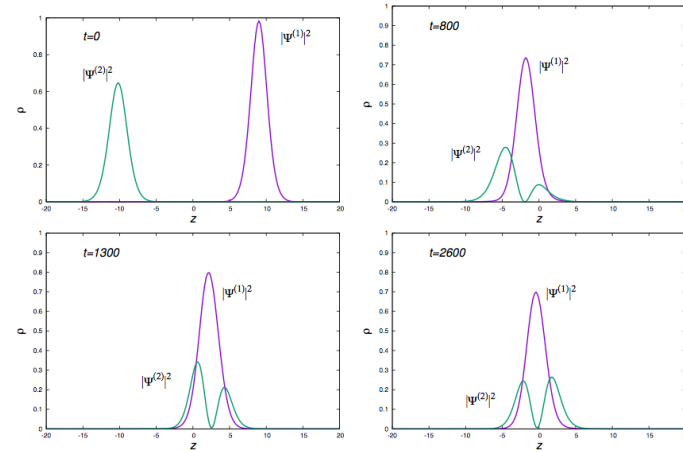   galaxies behavior around the MW and M31.

Results

Example of stability of the (1,0,0)+(2,1,0) solution

Example of formation of (1,0,0)+(2,1,0) Type of solution

Possible application to VPOS