

Limit profiles for normalized solutions to Gross-Pitaevskii-Poisson equations

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Cosmological models lead to the Gross-Pitaevskii-Poisson equation (GPP) study. This talk concerns some recent results about the existence of positive solutions with prescribed L^2 -norm for (GPP), in \mathbb{R}^3 . We consider (GPP) with a generic Riesz potential I_α , where $\alpha \in (0, 3)$. First, solutions' existence, nonexistence, and multiplicity are discussed in the alpha-regimes $\alpha \in (0, 1)$, $\alpha = 1$, $\alpha \in (1, 3)$. Then, the main novelty presented deals with studying the asymptotic behavior of the solutions, as the L^2 -norm goes to the boundary of the interval of existence of solutions. In particular, depending on the alpha-regimes and the solution analyzed, Choquard or Thomas-Fermi equations are involved.

This is a joint research with Vitaly Moroz and Giuseppe Riey.