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Dark matter profiles of SPARC galaxies

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Stellar and gas kinematics of galaxies are a sensitive probe of the dark matter distribution in the halo. The popular fuzzy dark matter models predict the peculiar shape of density distribution in galaxies: specific dense core with sharp transition to the halo. Moreover, fuzzy dark matter predicts scaling relations between the dark matter particle mass and density parameters. In this work, we use a Bayesian framework and several dark matter halo models to analyse the stellar kinematics of galaxies using the \textit{Spitzer Photometry \& Accurate Rotation Curves} database. We then employ a Bayesian model comparison to select the best halo density model. We find that more than half of the galaxies prefer the fuzzy dark model against standard dark matter profiles (NFW, Burkert, and cored NFW). While this seems like a success for fuzzy dark matter, we also find that there is no single value for the particle mass that provides a good fit for all galaxies.

Author: Dr RUDAKOVSKYI, Anton (Bogolyubov institute for theoretical physics Kyiv, Ukraine)

Co-authors: KHELASHVILI, Mariia (Bogolyubov institute for theoretical physics Kyiv, Ukraine); HOSSENFELDER, Sabine (Frankfurt Institute for Advanced Studies, Frankfurt, Germany)

Presenter: Dr RUDAKOVSKYI, Anton (Bogolyubov institute for theoretical physics Kyiv, Ukraine)

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