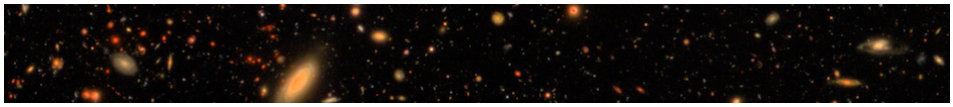

Contribution ID: **35** Type: **not specified**

Revisiting the core-halo structure of Fuzzy Dark Matter Halo

Wednesday, 29 September 2021 14:00 (25 minutes)

In simulations of Fuzzy Dark Matter (FDM) model, we always found gravitationally collapsed object composed of a solitonic core locating within a virialized halo. Although a measured relation between the core and halo mass, from simulation, is often adopted to make observational constraints on the particle mass, there is still a disagreement on the relation between different groups. To fully understand the relation, we have performed idealized soliton mergers and cosmological FDM simulation by solving the time-dependent Schrodinger-Poisson equation. We obtained large samples of core-halo structure which allows us to directly compare with the core-halo relation of previous works. We provided a simple empirical equation for the core-halo mass relation and, more importantly, found a diversity in the core-halo structure. The diversity implies that any observational constraint on the particle mass that adopted the core-halo mass relation will suffer from an additional 50% error. We suggest that the origin of the diversity is related to the environmental effect, such as tidal stripping, which requires simulations with more efficient numerical scheme to confirm. We will also shortly discuss other radius-halo mass relation which may pose a challenge to the FDM model, but motivate future FDM simulations to include baryonic physics.

Presenter: HEI YIN JOWETT CHAN

Session Classification: Wednesday PM