Research Report
ICRR Inter-University Research Program 2020

Research Subject: Collaboration for gravitation wave observatory in study dark matter with compact binary coalescence

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Summary of Research Result :
We have studied the self-interacting dark matter model. The candidates for dark matter in these models can interact with Higgs Boson and self scattering among dark matter particles. The galaxies and cluster galaxies will be a cosmic collider to measure these self scattering dark matter particles. One of the constraints is solving the core cusp problem in draft galaxies, cross-section of the scattering have to fall with velocity and energy to avoid the limitations of the clusters. To explain the core cusp problem, we used the N body simulations of the self-interaction dark mater with the baryons to see the effect of the dark matter in the small scale structure problems. The MeV dark matter model in which dark matter self-interaction can be constrained by observation of gravitational wave from binary neutron star mergers and how the density of the dark matter affects the physical properties of the neutron star and its tidal deformability. The result of this studies published at the Modern Physics Letter A and talks at the American Physics Society April meeting (Acknowledgement for ICRR's Inter-University Reserach Program).

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