

# DYNAMICAL STABILITY OF UNIFORMLY ROTATING BINARY STARS AND GALAXIES

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## ABSTRACT

In this talk, we are concerned with dynamical stability of uniformly rotating binary stars and galaxies, which are represented as stationary solutions to Euler-Poisson equations and Vlasov-Poisson equations respectively. These solutions were constructed as minimizers of suitable variational problems by McCann [2] in which some kind of structural stability on them is discussed. This talk focuses on the nonlinear dynamical stability of them, based on Cazenave-Lions type arguments [1] exploiting variational characterization of stationary solutions. We will see that the uniqueness of a minimizer, which is one of main results of our work, plays an indispensable role in analysis.

## REFERENCES

1. Cazenave, T. and Lions, P.-L., “Orbital stability of standing waves for some nonlinear Schrödinger equations”, *Comm. Math. Phys.*, 85 (1982), no. 4, 549–561.
2. McCann, Robert J., “Stable rotating binary stars and fluid in a tube”, *Houston J. Math.*, 32 (2006), no. 2, 603–631.