**Mass determination of open clusters using kinematics data**

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ABSTRACT

We estimate the mass of three open clusters, NGC 2168, NGC 188, NGC 6819, using kinematics data of open cluster stars member. Radial velocity data determined from WIYN survey and proper motion determined from Gaia DR2. Using virial theorem and projected-mass estimator method we estimate the mass of star open clusters. By using nbody simulation we try both method and we found that the proper motion data from Gaia DR2 is not enough to determine open clusters mass accurately. The accuracy of estimated mass affected by some parameters such as membership probability of stars sample, the distance, age, and angular radius of open clusters. The mass of open clusters using virial theorem is 3341 M⊙ for NGC 2168, 4346 M⊙ for NGC 188, and 4097 M⊙ for NGC 6819.

*Keywords: open cluster; proper motion; radial velocity; n-body simulation*