Abstract

N-body simulations of young star clusters can inform our understanding of star formation. These simulations allow us to explore the effects of various parameters on the evolution of the cluster and its associated disk. We present here a detailed comparison of two different models, Large and Medium, that consider the effects of rejuvenated accretion and the role of planetary mass objects in the cluster.

Introduction

Radio continuum images of young star clusters, such as those obtained by the EVLA, have shown the presence of clumpy and turbulent regions. These regions are thought to be the sites of ongoing star formation and disk accretion. In this study, we use N-body simulations to model the gravitational dynamics of stars in a synthetic star cluster, with the goal of understanding the effects of accretion on the cluster's evolution.

Physical Processes in Model

We consider the following physical processes:

- **Bondi-Hoyle Accretion**: This process describes the accretion of gas onto a star, where the gas falls into the gravitational potential well of the star under the influence of gravity. We use the Bondi-Hoyle formalism to compute the Bondi-Hoyle accretion.

- **Rejuvenated Bondi-Hoyle Accretion**: This is a modified version of Bondi-Hoyle accretion, where the gas is accreted onto the star over a longer timescale. We use N-body simulations to model this process.

- **Gas dispersal**: We consider the dispersal of molecular gas through the cluster, which is affected by the gravitational dynamics of the stars. We use the Bondi-Hoyle formalism to model this process.

- **Planetary mass objects**: We consider the presence of planetary mass objects in the cluster, which can affect the gravitational dynamics of the stars. We use N-body simulations to model this process.

- **Stellar evolution**: We consider the evolution of the stars in the cluster, which can affect the gravitational dynamics of the stars. We use N-body simulations to model this process.

Results

- **Mass accretion rates into star-forming disks**: We find that the mass accretion rates into star-forming disks are lower than previously estimated, which is consistent with the results of Muzerolle et al. (2005).

- **ACCRETION RATE VS STELLAR MASS**

- **ACCRETION RATE Vs STELLAR MASS OBSERVED**

References

- **Muzerolle et al. (2005)**

- **CASA, University of Colorado, Boulder, CO**

- **John Bally**