



Cosmic history of integrated galactic stellar initial mass function: a simulation study

Tanuka Chattopadhyay

Dept. of Applied Mathematics, Calcutta University, India, tanuka2008@gmail.com

Theoretical as well as observational studies suggest that the stellar initial mass function (IMF) might become top heavy with increasing redshift. Embedded cluster mass function is a power law having index β , whose value still remains controversial. In the present work, we investigate the effect of evolving IMF and varying indices of β for the integrated galactic initial mass function, in relation to the characteristic star formation rate of galaxies at various redshifts by random simulation. The resulting IGIMF is segmented power law at various redshifts having slopes $\alpha_{1,IGMF}$ and $\alpha_{2,IGMF}$ with a turnover at a characteristic mass m_c . These differ from the stellar initial mass functions with slopes $\alpha_{1,IGMF}$ and $\alpha_{2,IGMF}$ and characteristic masses m_c for different values of redshift z , β , minimum and maximum masses of the embedded clusters.

Key words: cosmic history, initial mass function, redshift, simulation