On the determination of stellar mass and binary fraction of open clusters within 500 pc

Jiang et al. 2023, in prep.

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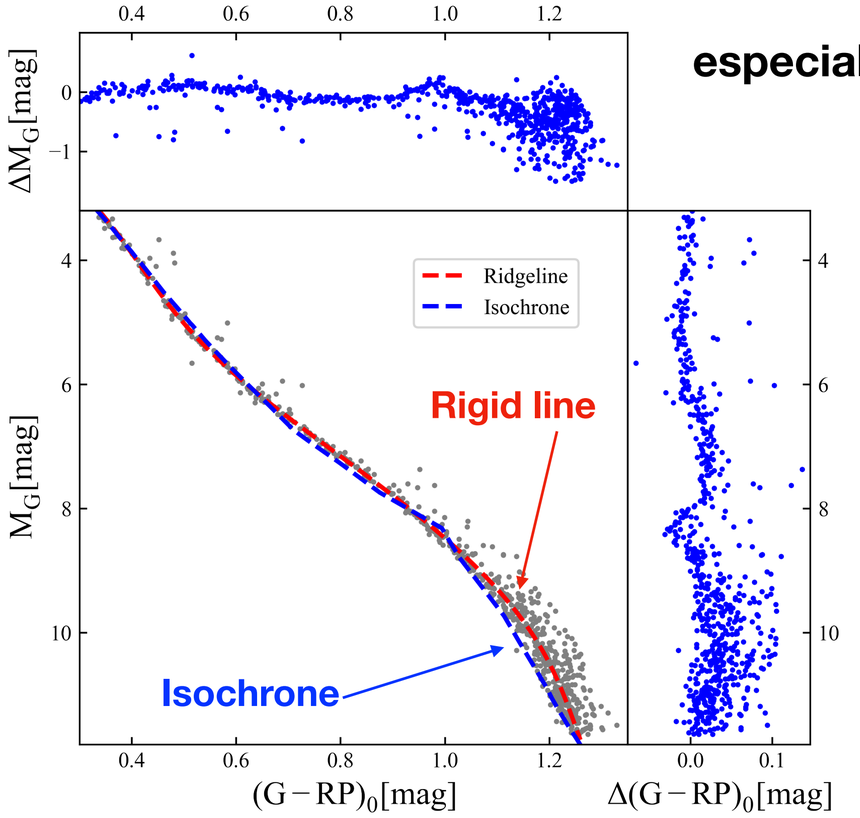
Cluster Sample：114 open clusters from OCSN catalog (Qin et al. 2023)

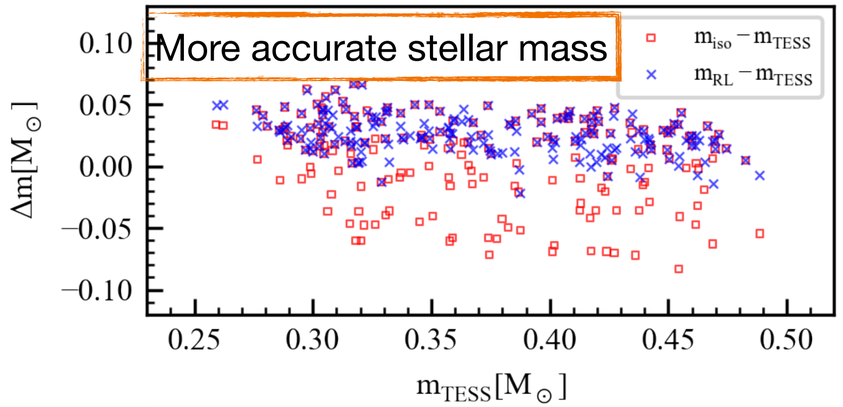
Stellar Mass Estimation

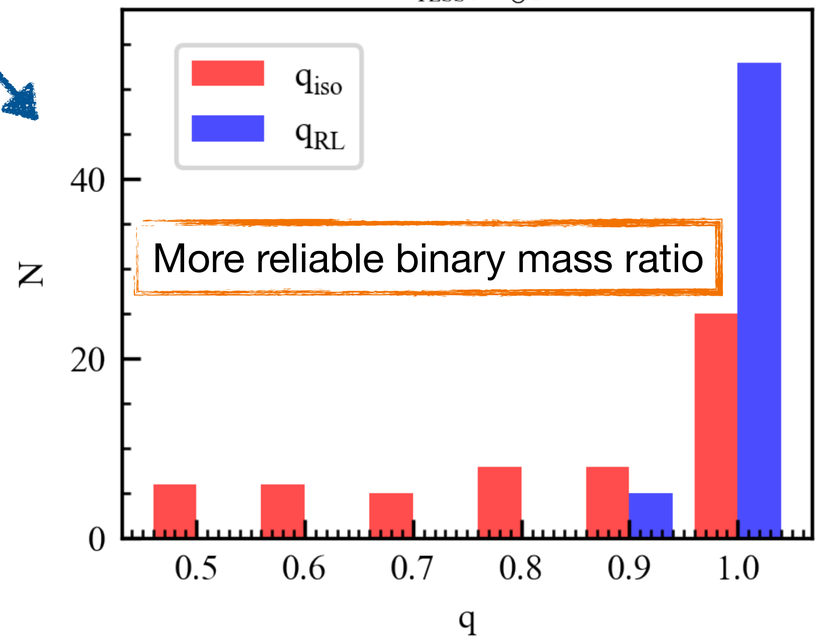


especially for the low-mass stars!

Padova isochrone
(Marigo et al. 2017)

Rigid line
from ITGP (Li et al. 2021)





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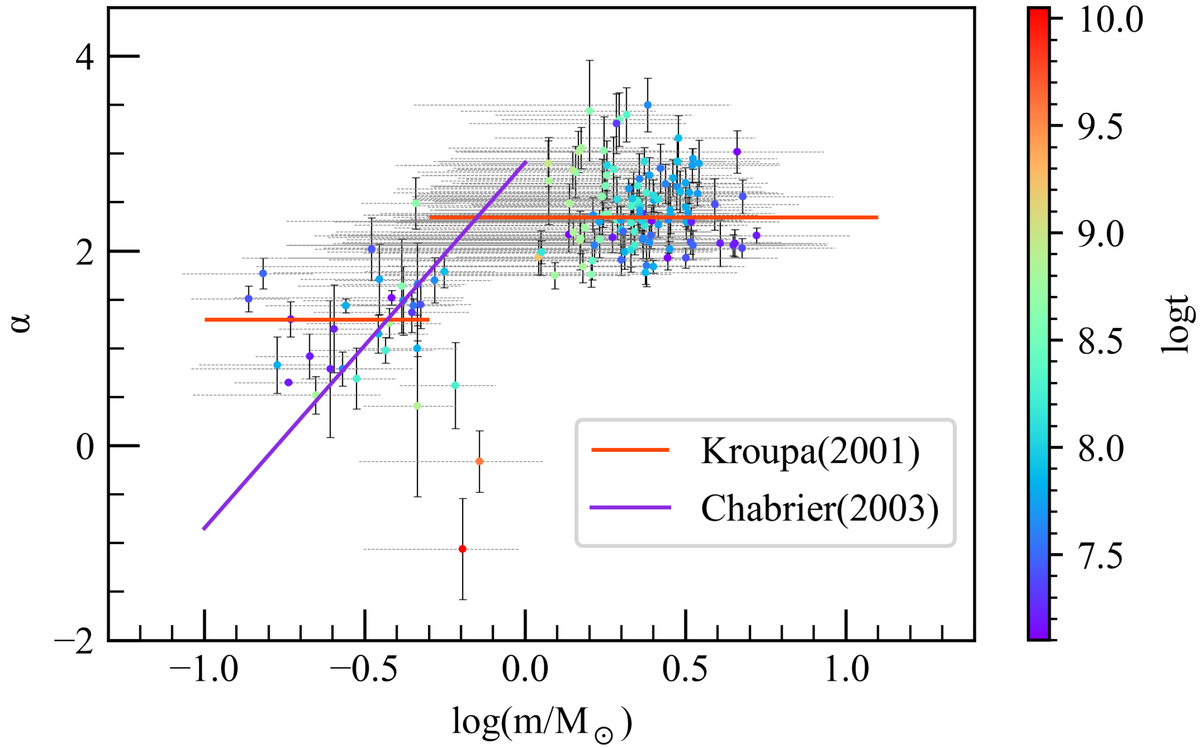
Cluster PDMF

- Median values of α at the high-mass and low-mass end are 2.37 and 1.28
- Roughly consistent with the multiple-part power-law IMF in Kroupa (2001)



Cluster catalog

- Estimate stellar mass of 35736 member stars
- Properties of 114 open clusters

Table 1. Description of the catalog of cluster properties.

Column	Format	Unit	Description
Cluster	string	-	Cluster name in Qin2023
logt	float	-	Cluster age determined by RL fitting with isochrone
E(B-V)	float	mag	Cluster reddening determined by RL fitting with isochrone
DM	float	mag	Cluster distance modulus determined by RL fitting with isochrone
Z	float	dex	Cluster metallicity determined by RL fitting with isochrone
M_{tot}	float	$M_\odot$	The total mass of cluster
N	float	-	The number of cluster members
f_b	float	-	The binary fraction of cluster
α_h	float	-	The index α of PDMF at the high mass end
e_α_h	float	-	The measured uncertainty of α_h
α_l	float	-	The index α of PDMF at the low mass end
e_α_l	float	-	The measured uncertainty of α_l
MR_h	string	-	The mass range of high mass end
MR_l	string	-	The mass range of low mass end
R_h	float	pc	The half-mass-radius of cluster
T_E	float	yr	The relaxation time of cluster
A^+	float	-	The index of mass segregation (see Subsection 4.2)