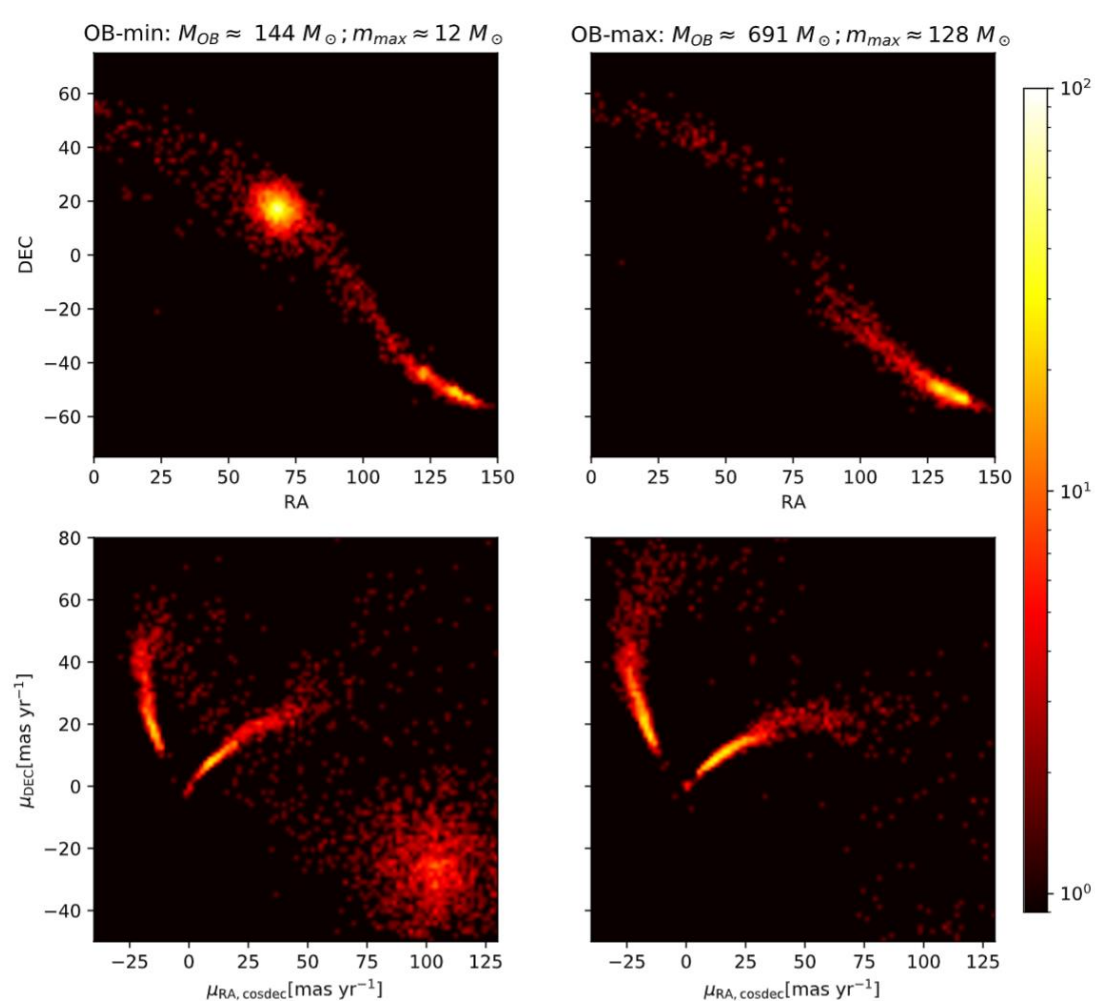


The strong impact of massive stars on the fate of open star cluster and their tidal streams

Long Wang* (the University of Tokyo) and Tereza Jerabkova (European Space Agency)

The initial condition of young open star clusters provides important information to understand how star forms. However, we carried out star-by-star N-body models using PeTar and found that if OB stars randomly form, the fate of star clusters become unpredictable. The rich kinetical data from Gaia can help to identify the tidal streams of clusters, which can better constrain the initial OB content and improve our understanding of the nature of initial mass function.

The very different fate of Hyades-like star clusters with the same initial condition



Randomly sampling IMF

Variation of OB star mass (M_{OB})

large $M_{OB} \rightarrow$ disruption (left)
small $M_{OB} \rightarrow$ survival (right)

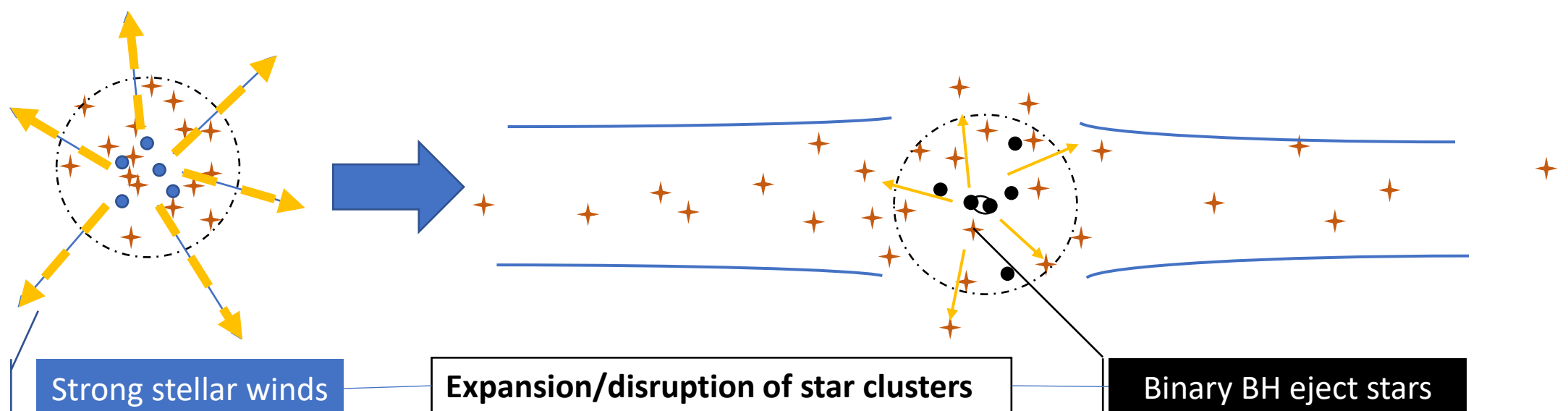
Mock observations of two N-body models with the same IMF and density profile but different M_{OB}

Why mass/number of OB stars matter?

More OB stars

Faster expansion

More stars on tidal tails



See Wang & Jerabkova (2021) A&A (<https://arxiv.org/abs/2109.04592>) for detail!