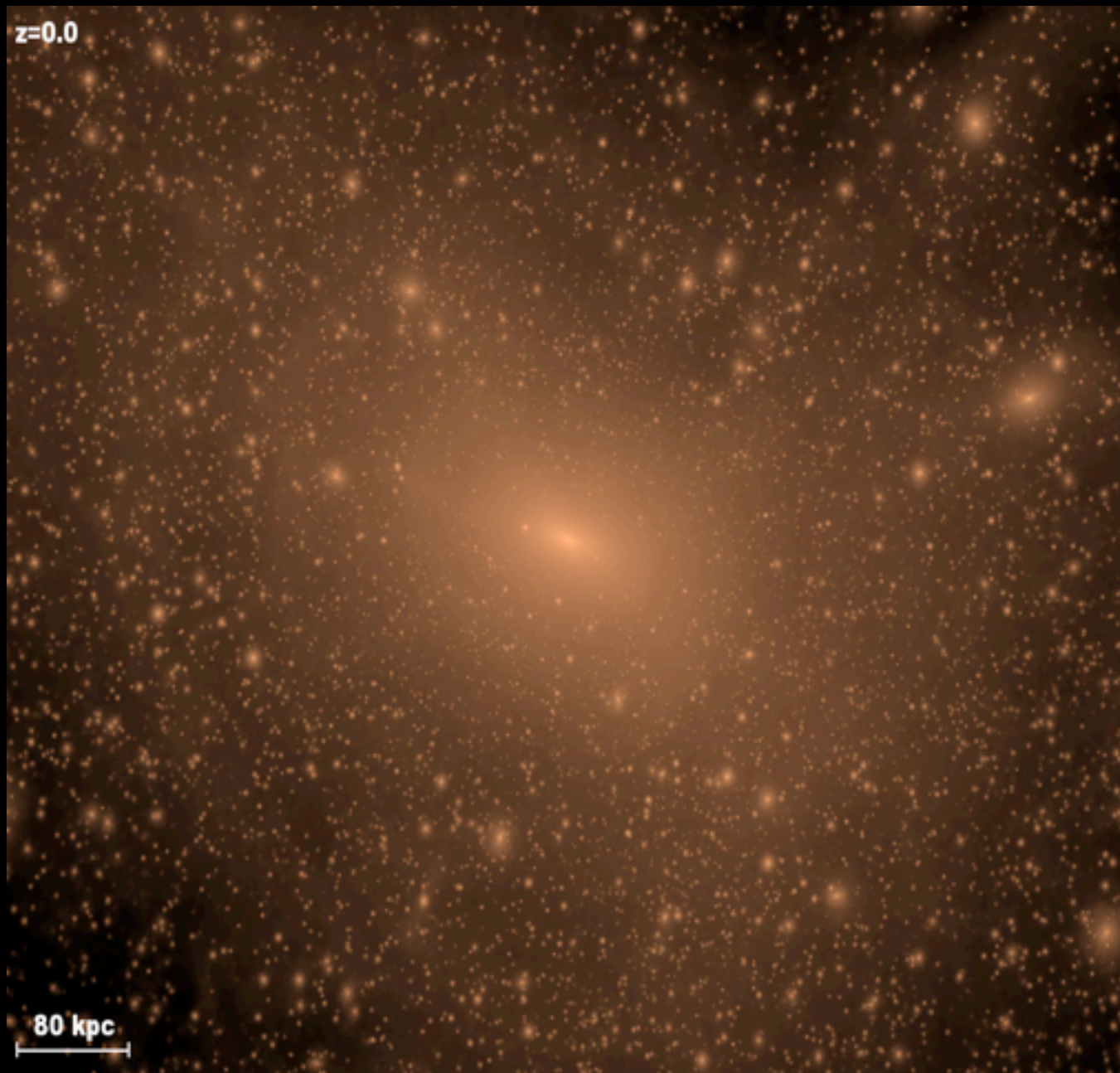


Estimating The Accretion Times of MW Satellites

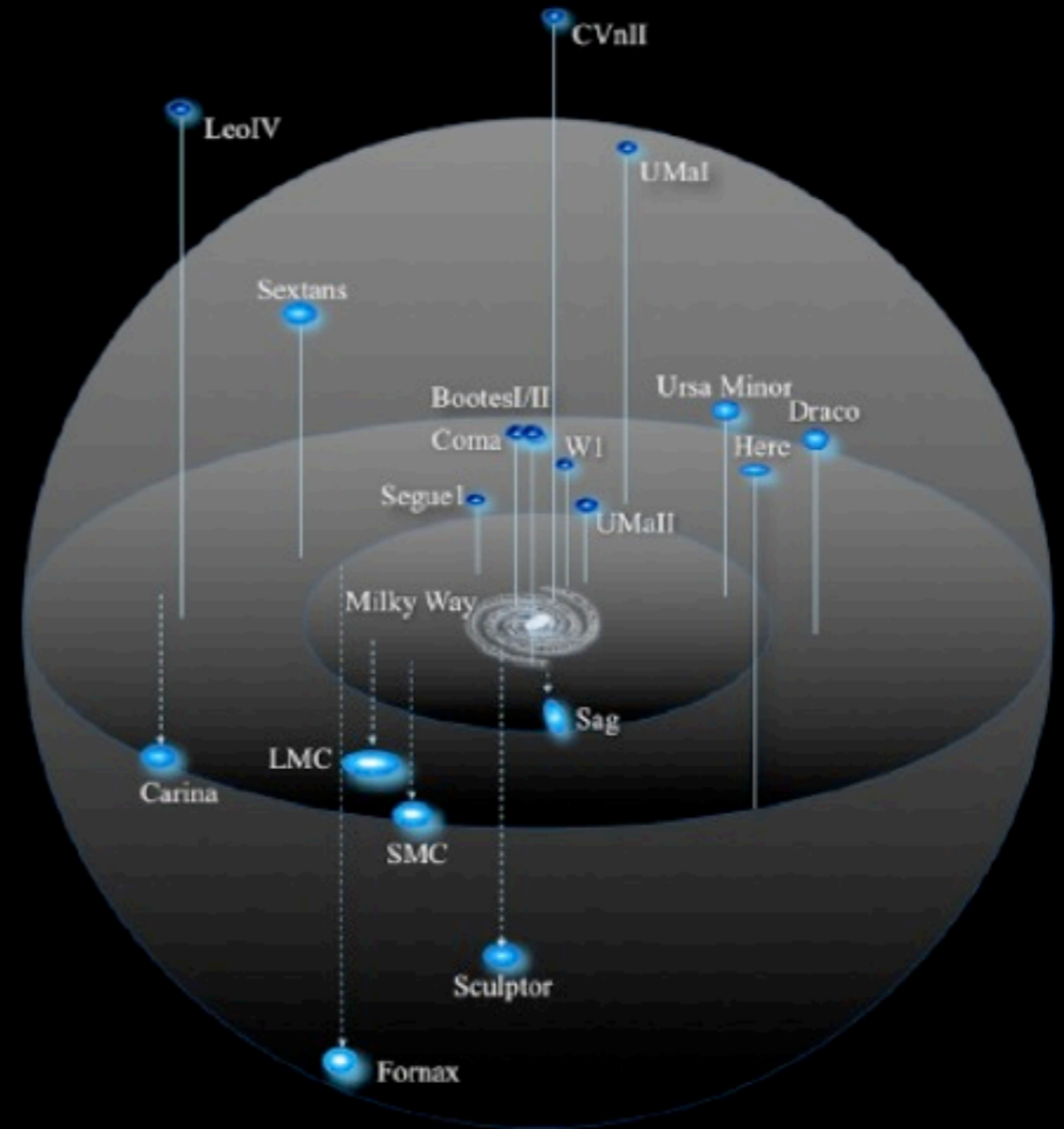
Miguel Rocha (UCI)
Santa Cruz 2011

Collaborators: Annika Peter,
James Bullock, Manoj
Kaplinghat

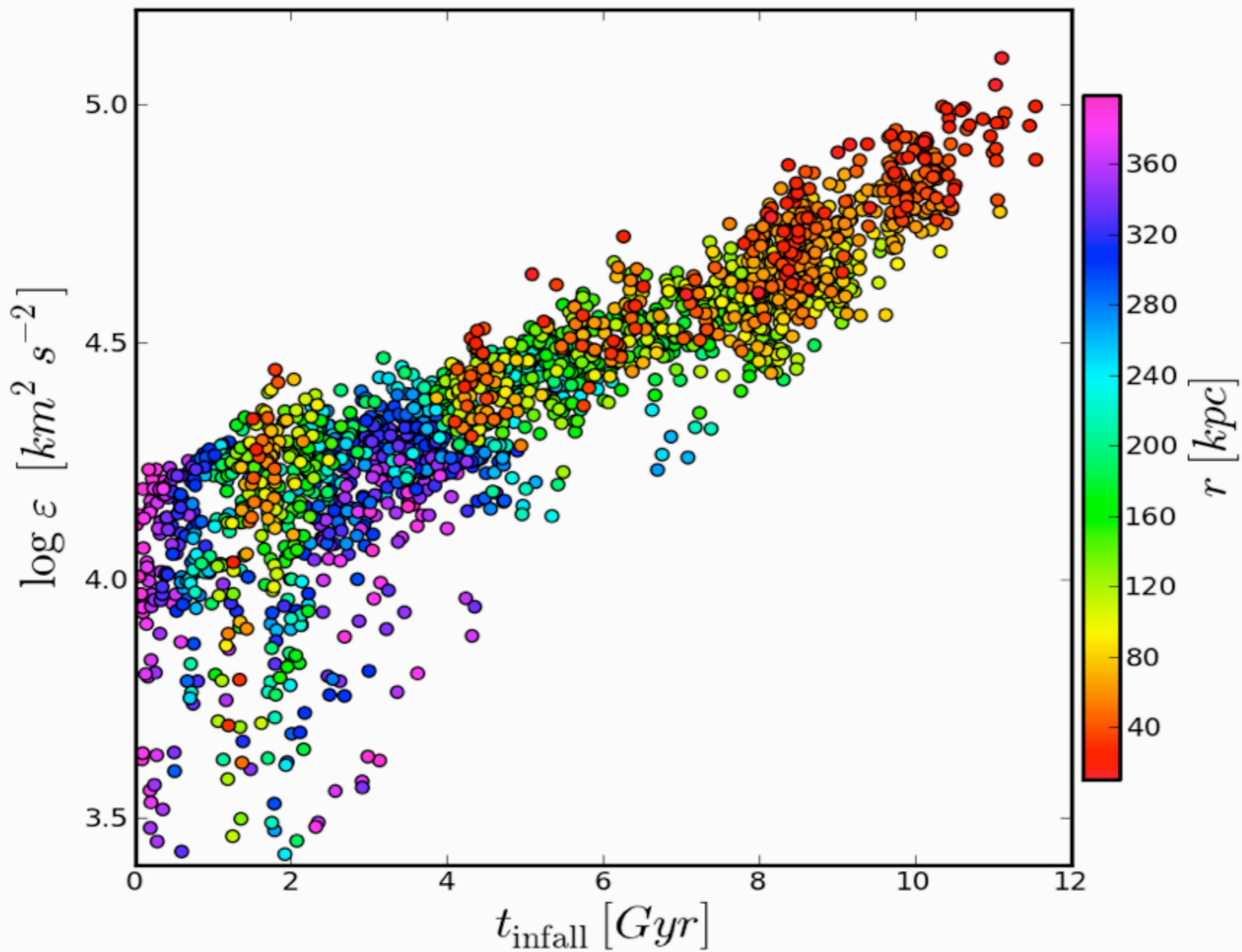
Can we estimate accretion times?



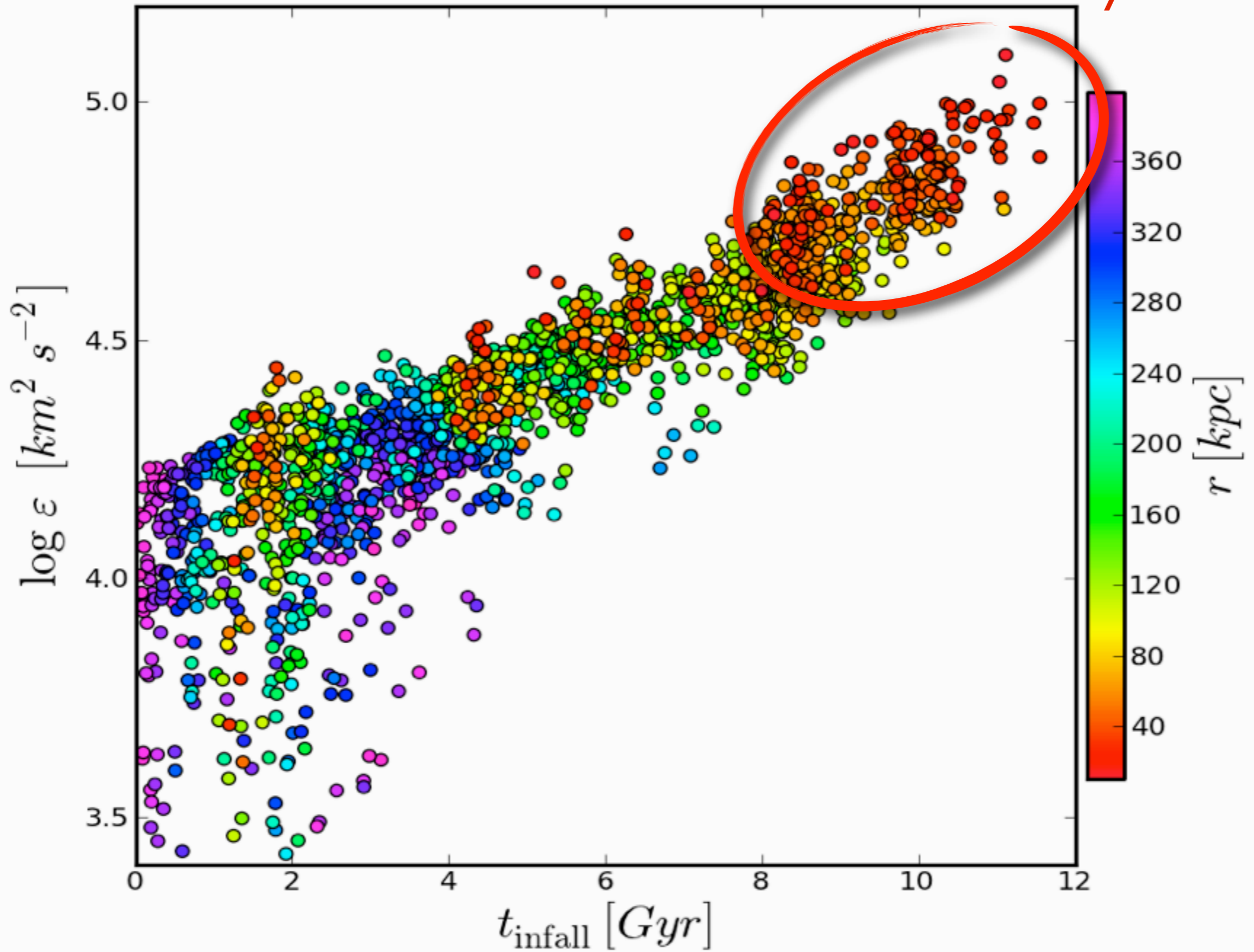
VL2



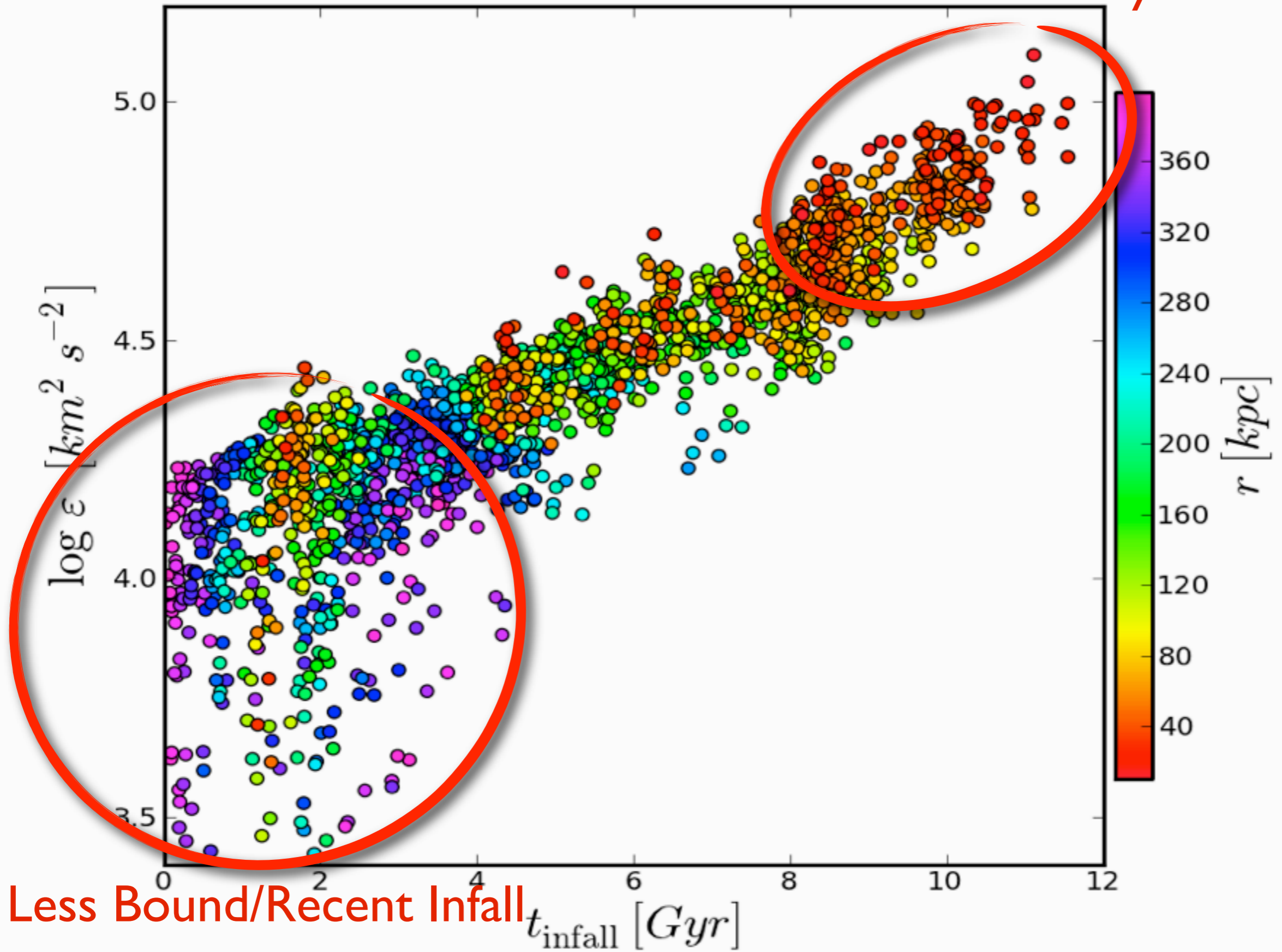
MW



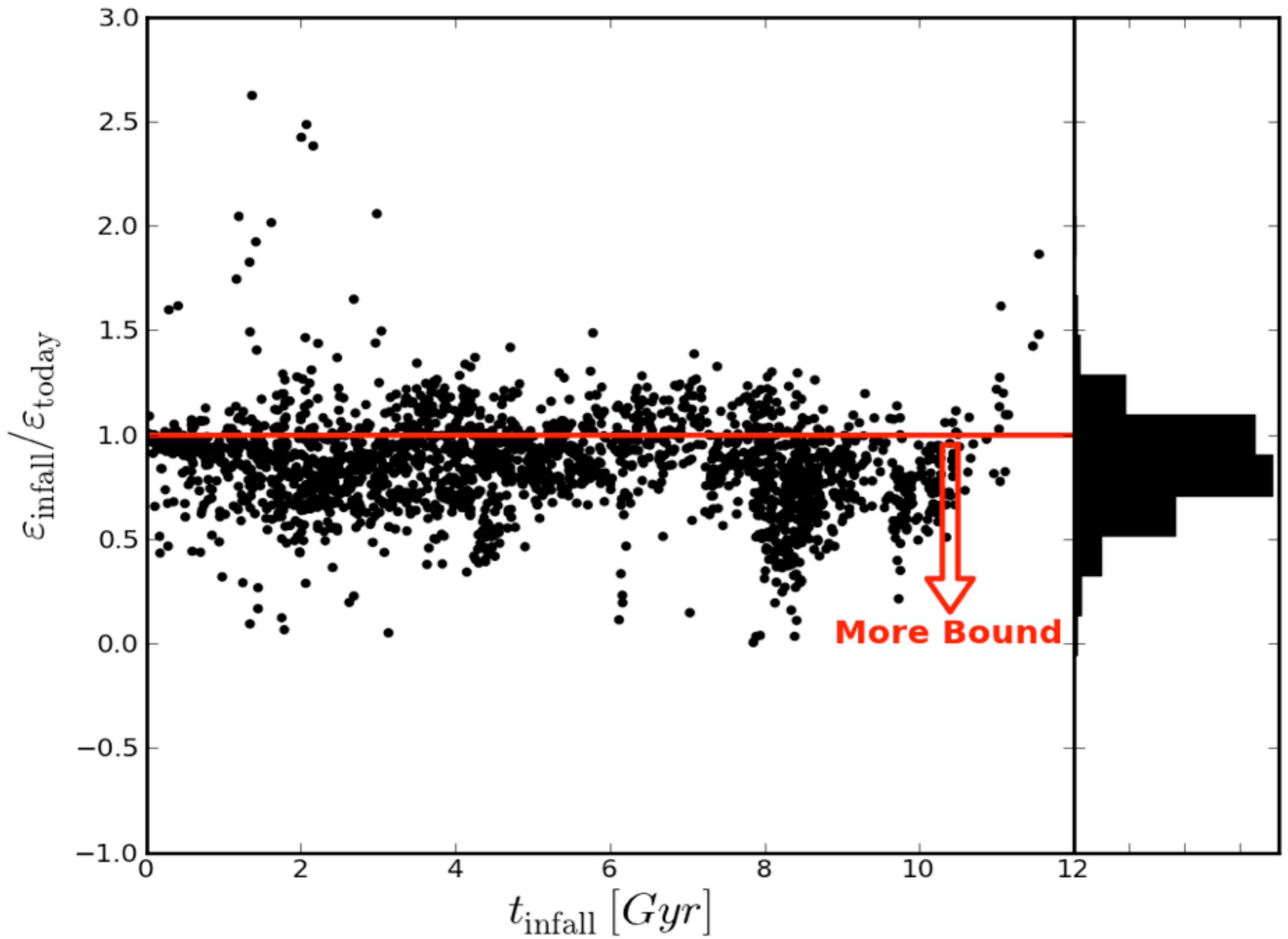
More Bound/Early Infall



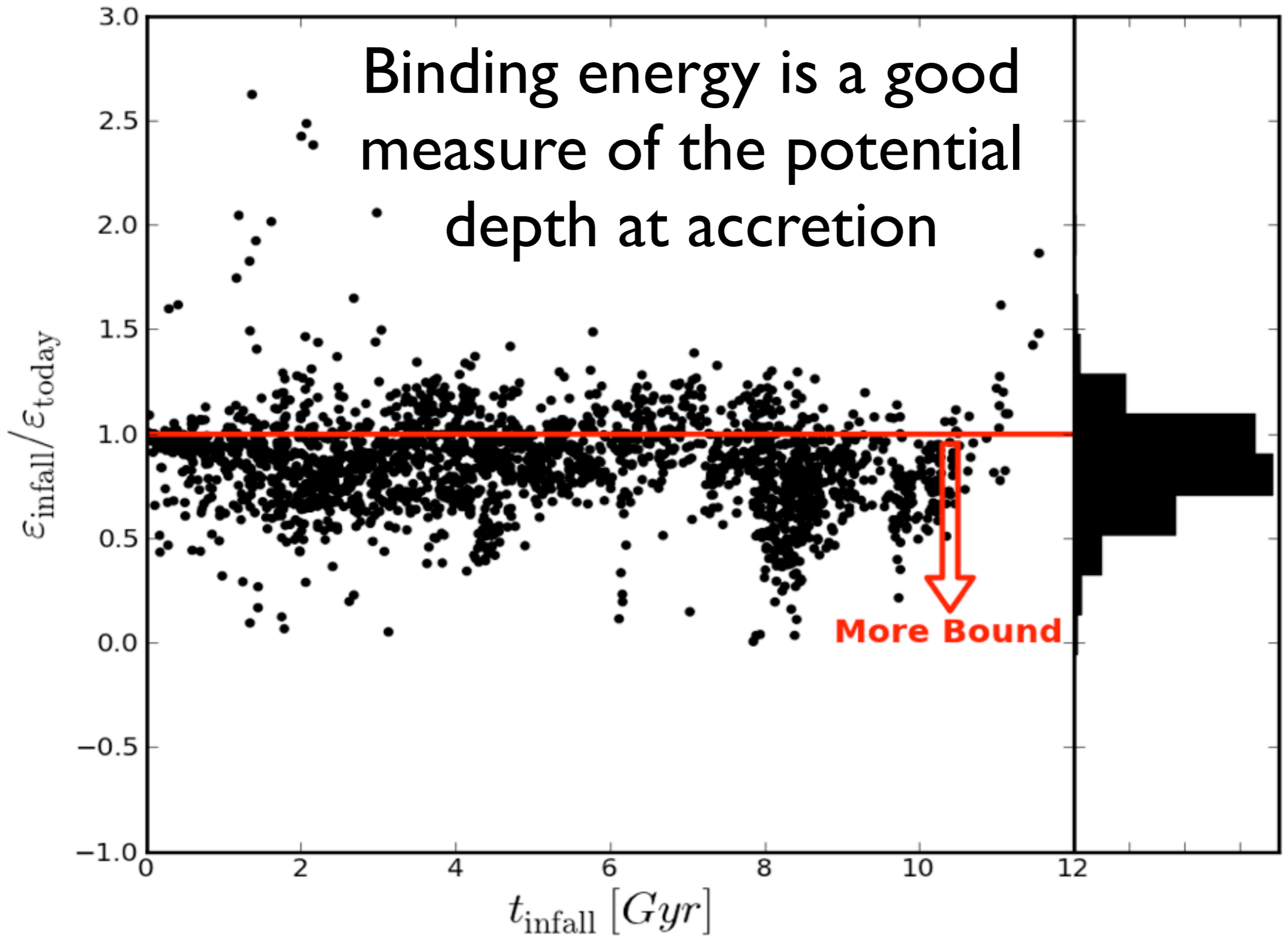
More Bound/Early Infall



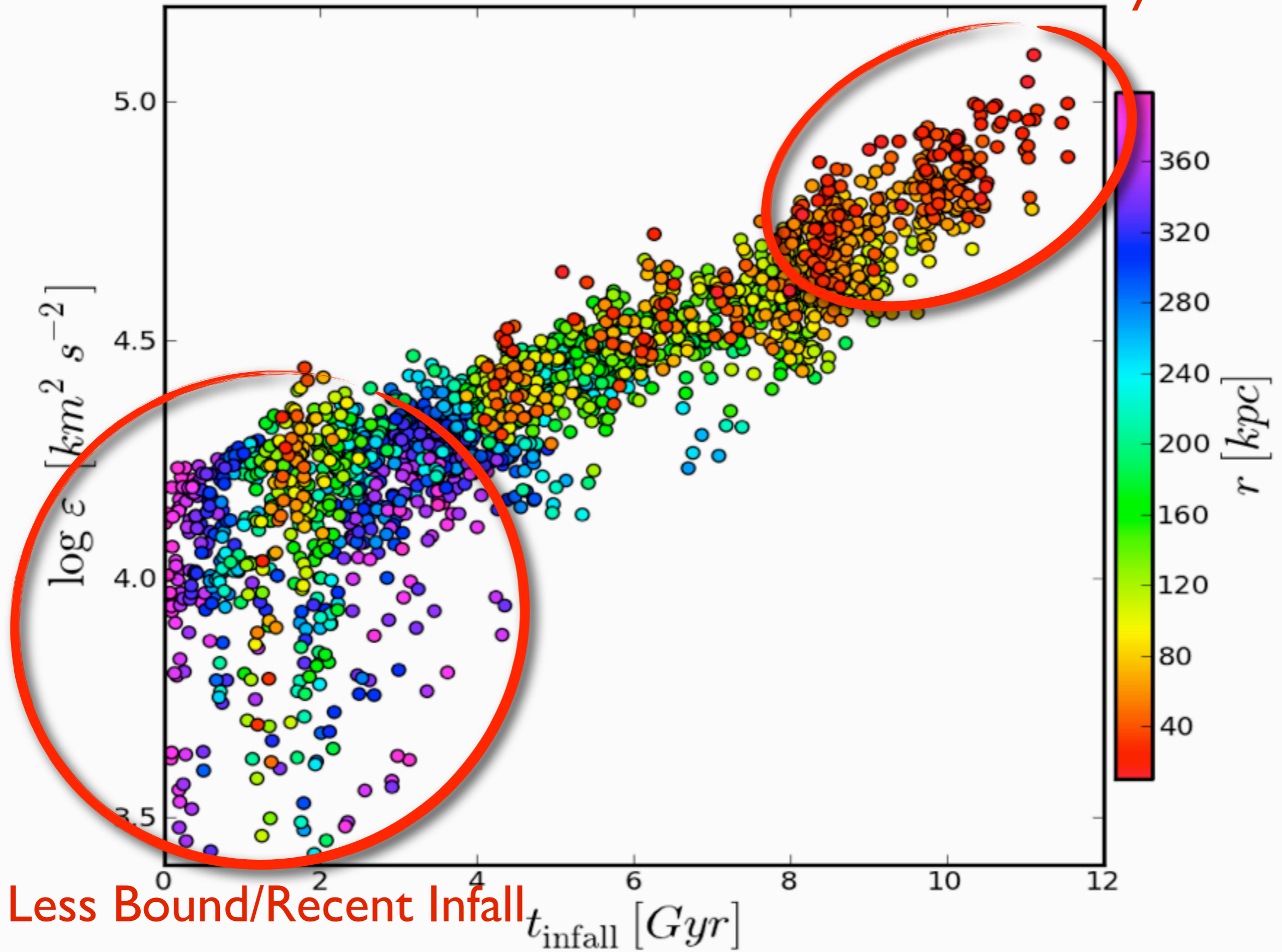
Less Bound/Recent Infall



Binding energy is a good
measure of the potential
depth at accretion

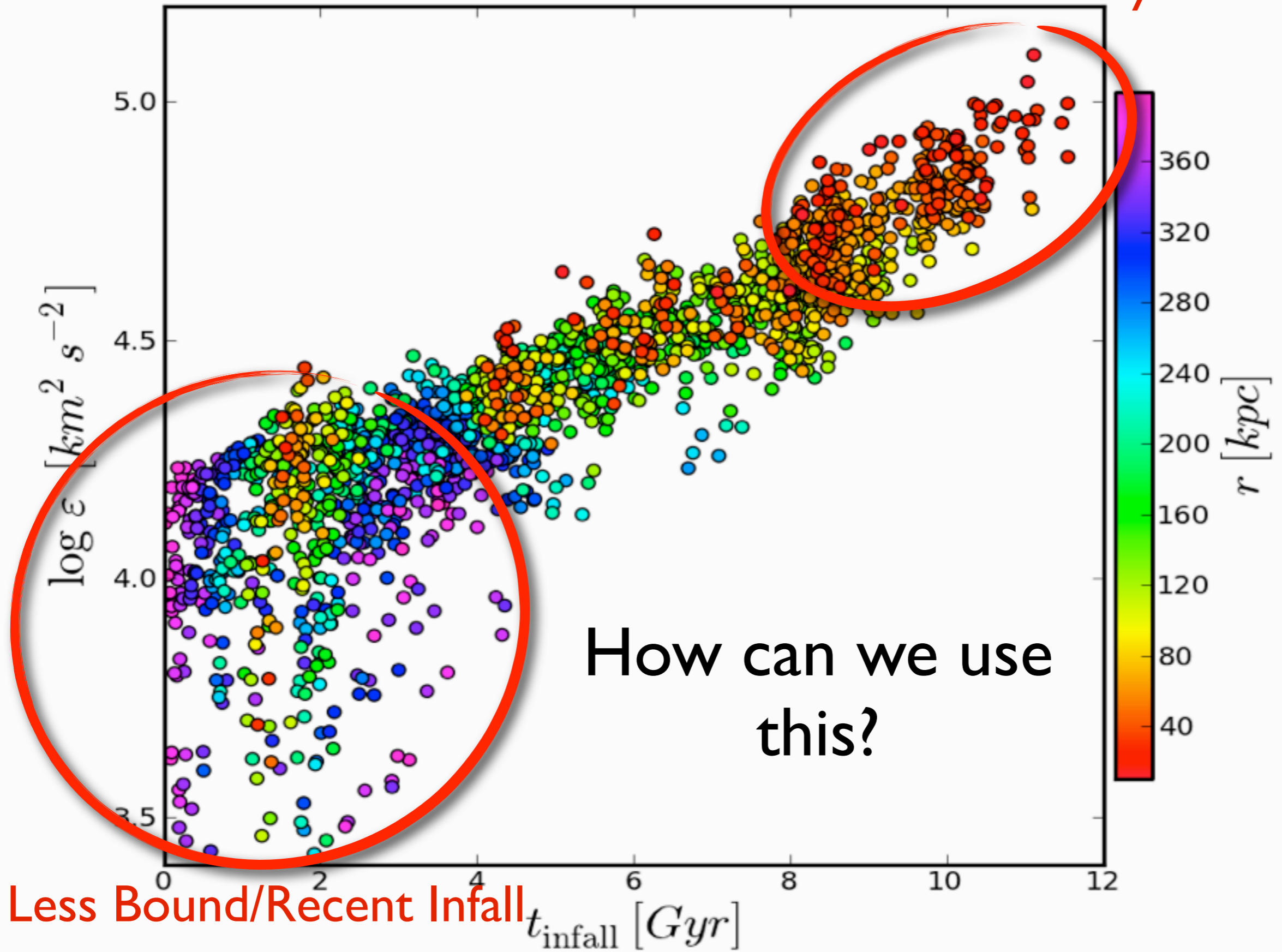


More Bound/Early Infall



Less Bound/Recent Infall

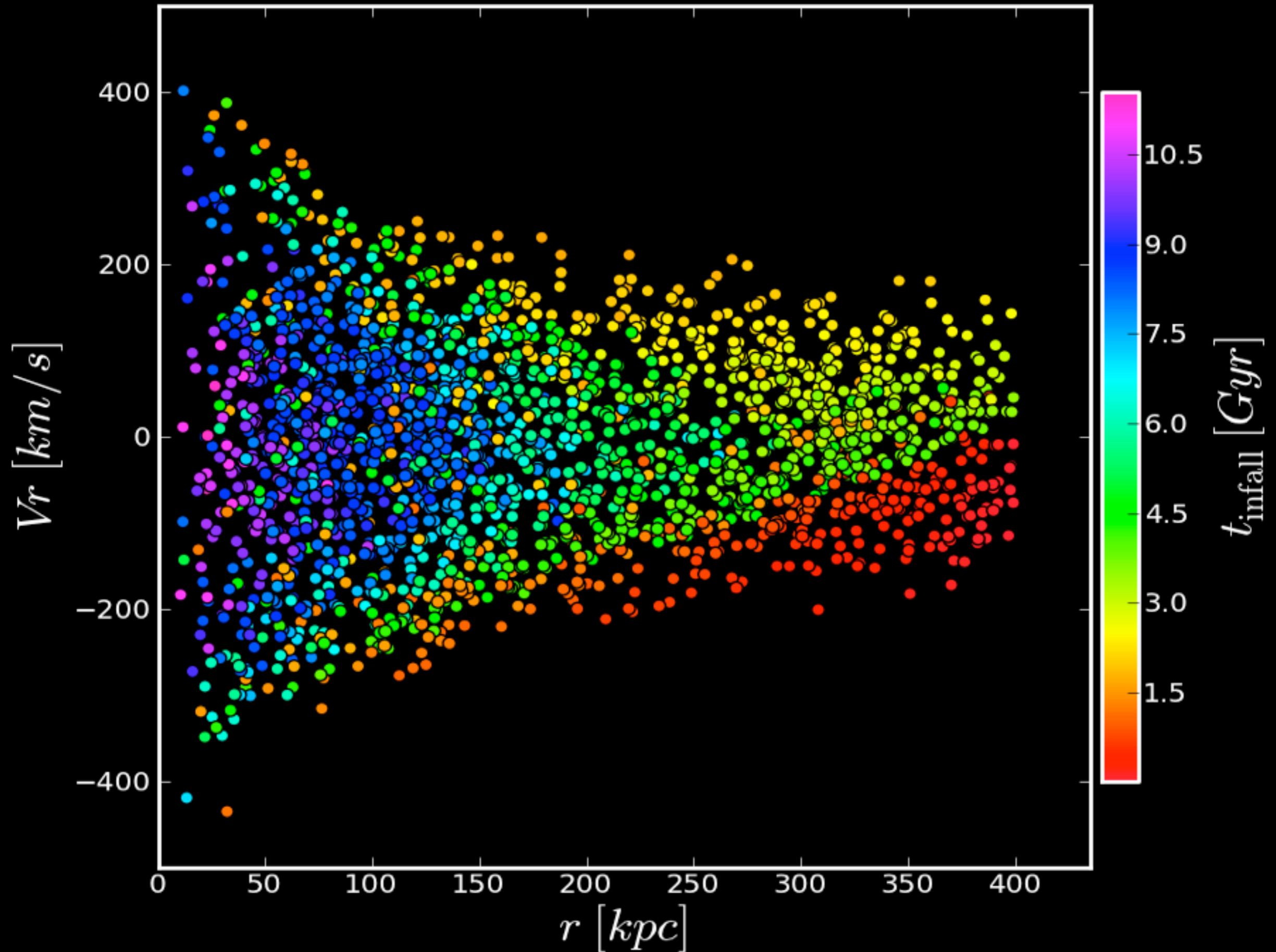
More Bound/Early Infall



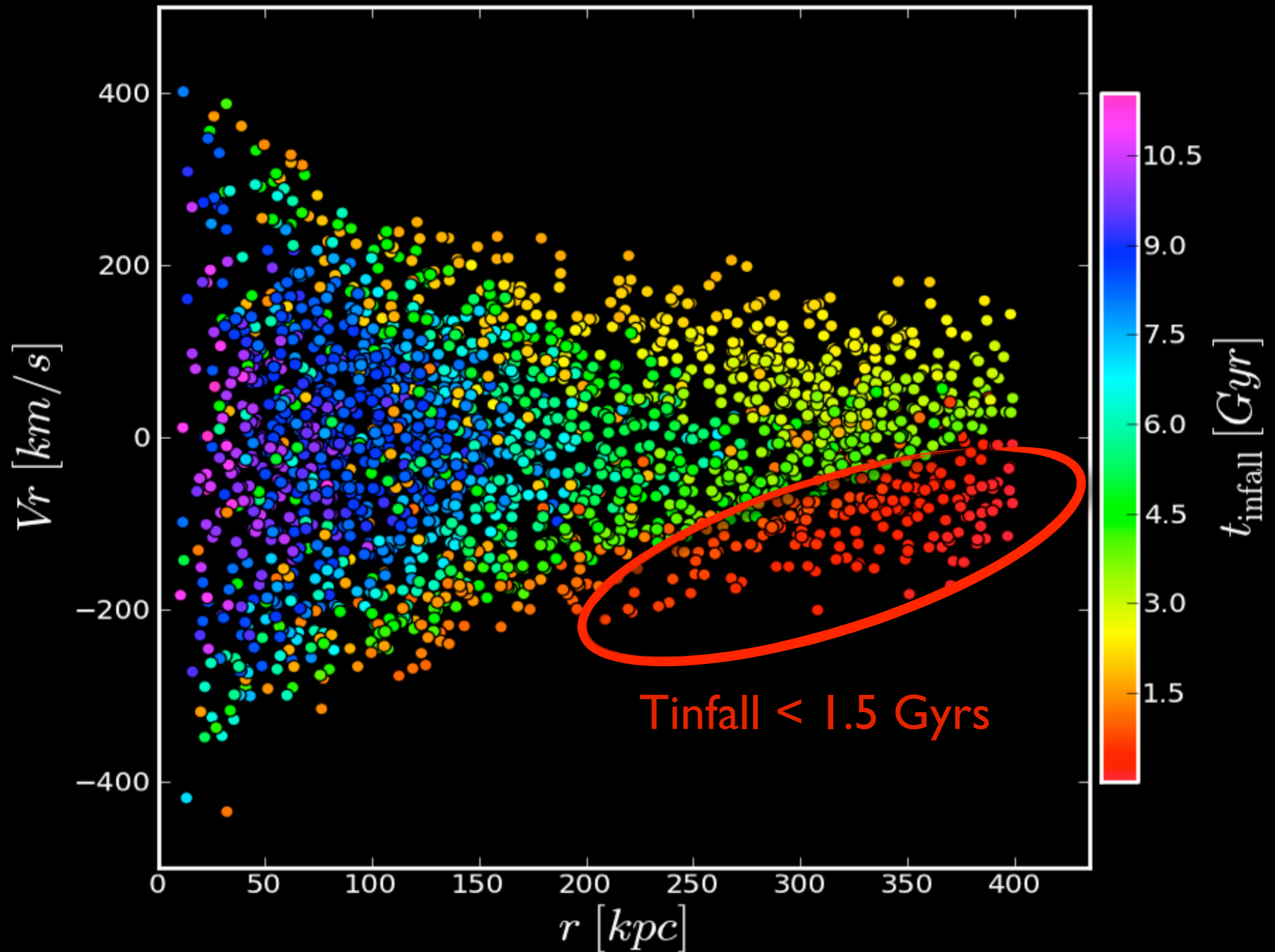
Less Bound/Recent Infall

How can we use this?

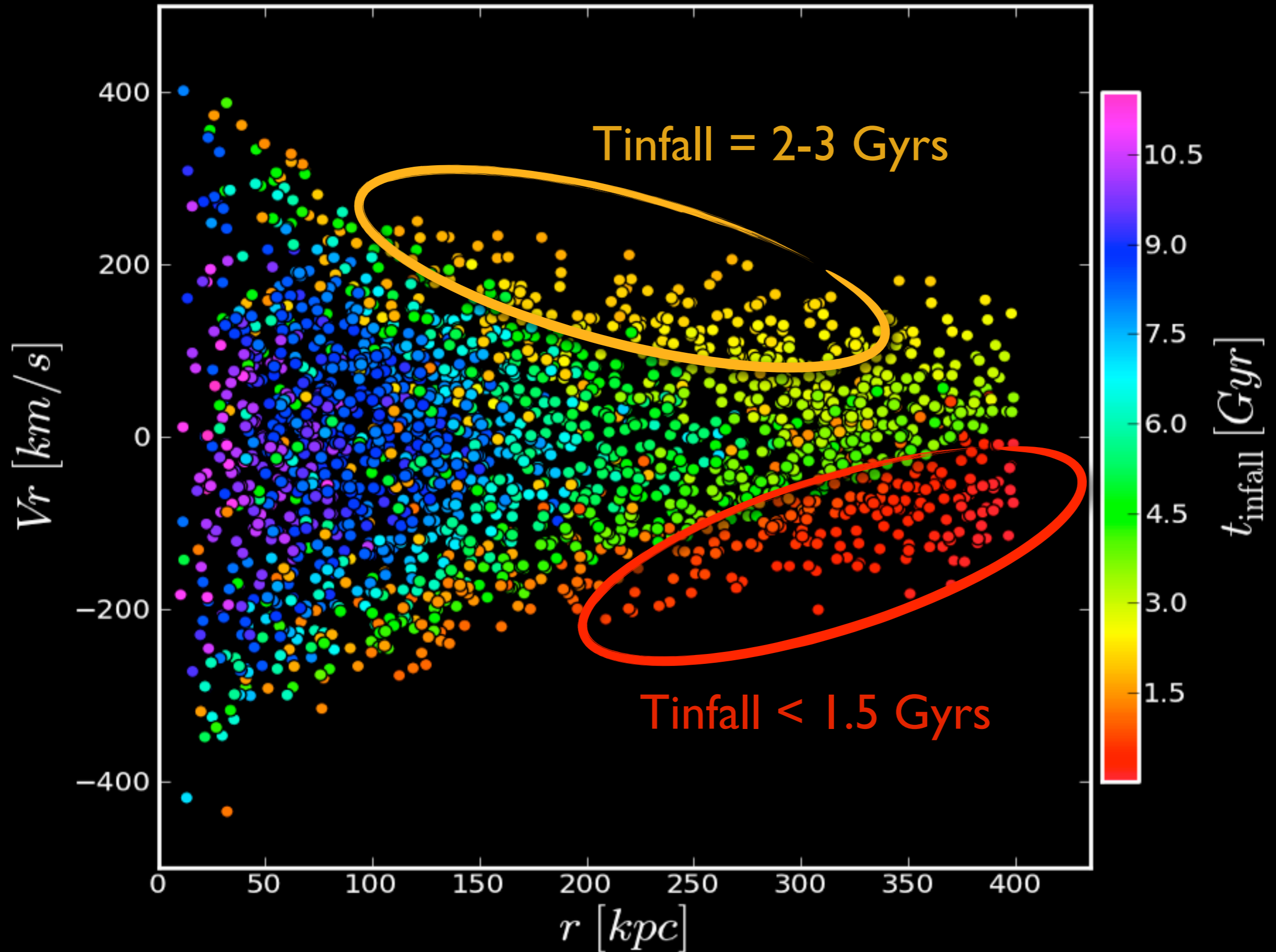
A correlation is visible in the r and V_r space



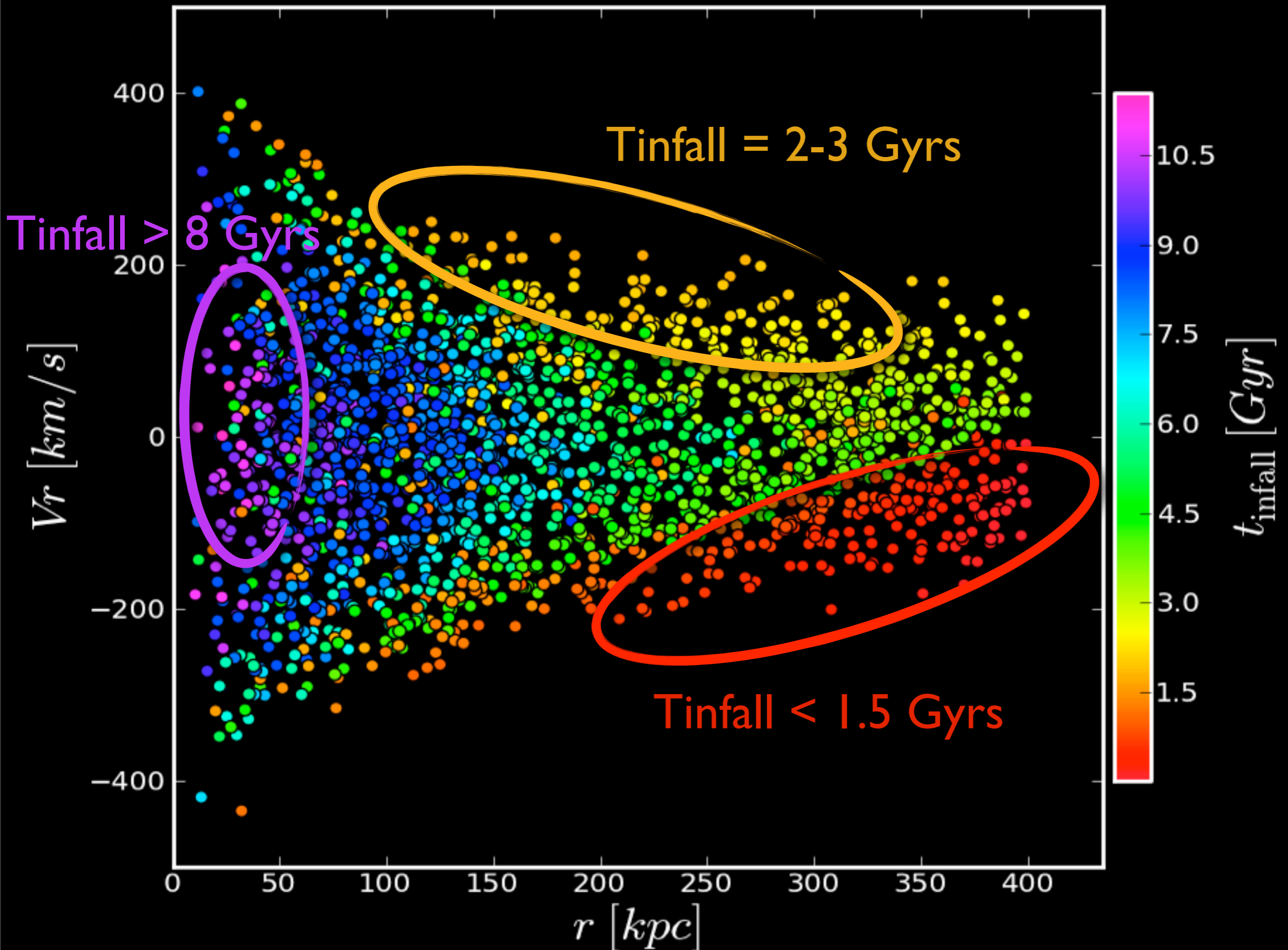
A correlation is visible in the r and V_r space



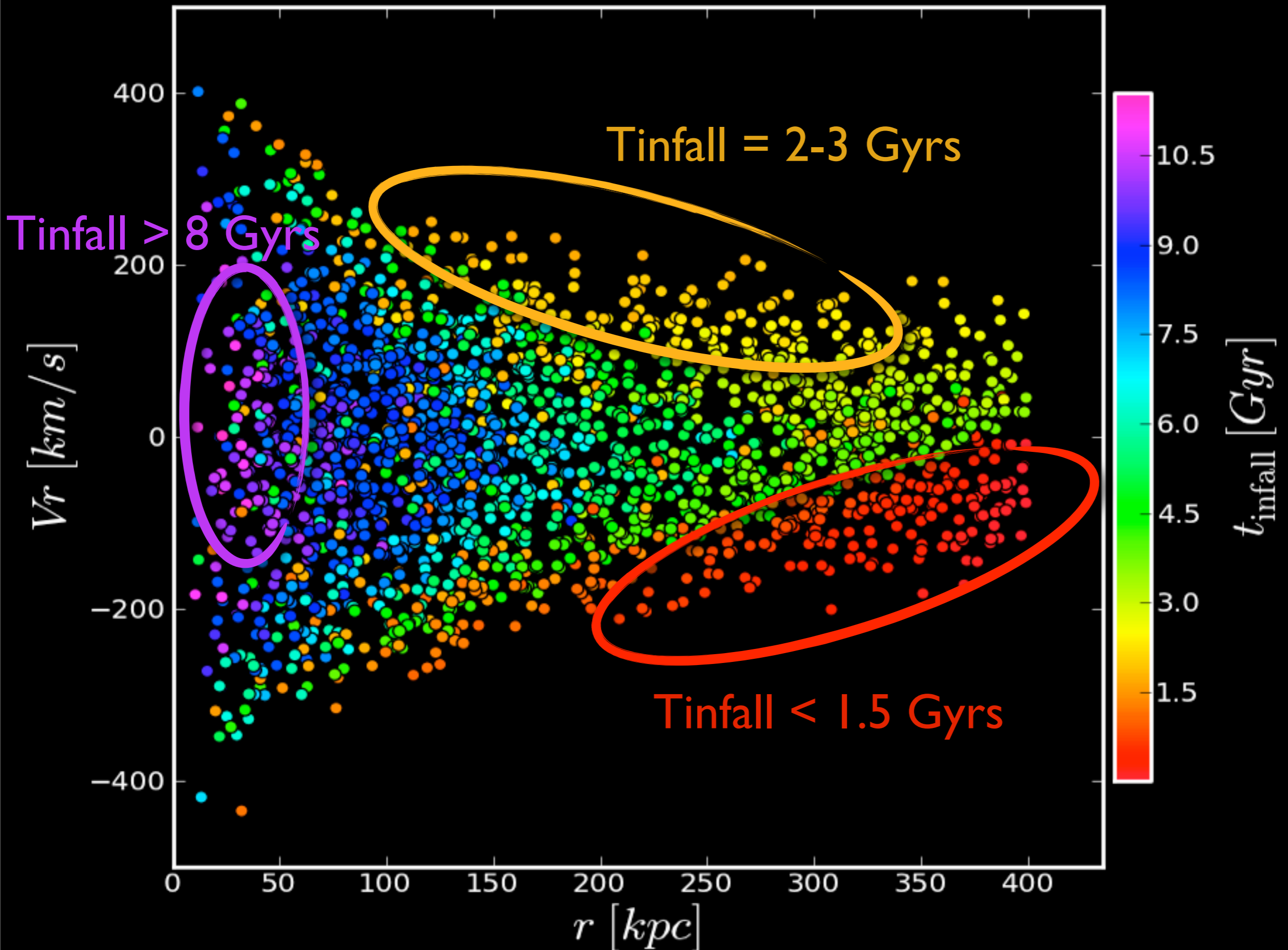
A correlation is visible in the r and V_r space



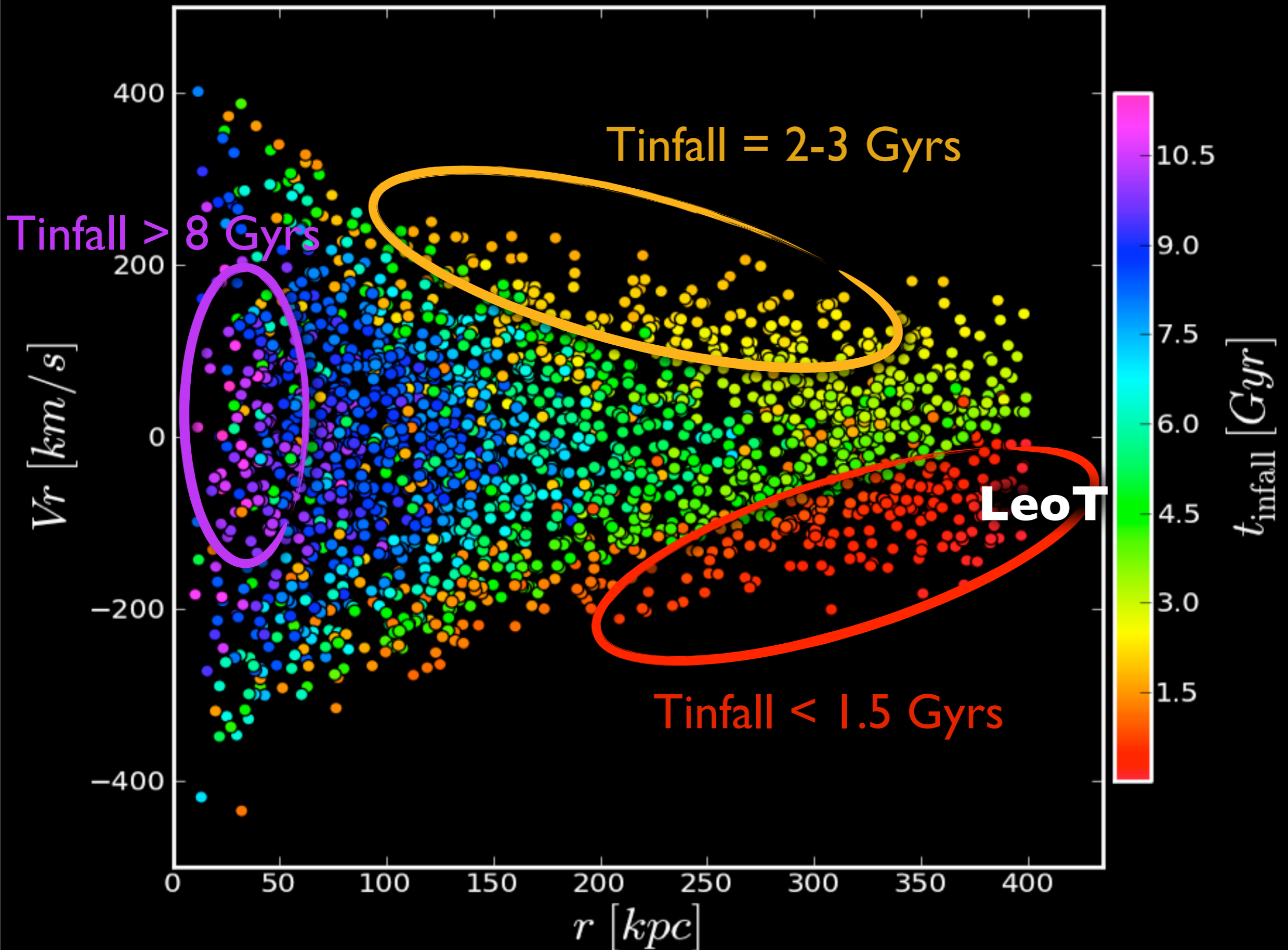
A correlation is visible in the r and V_r space



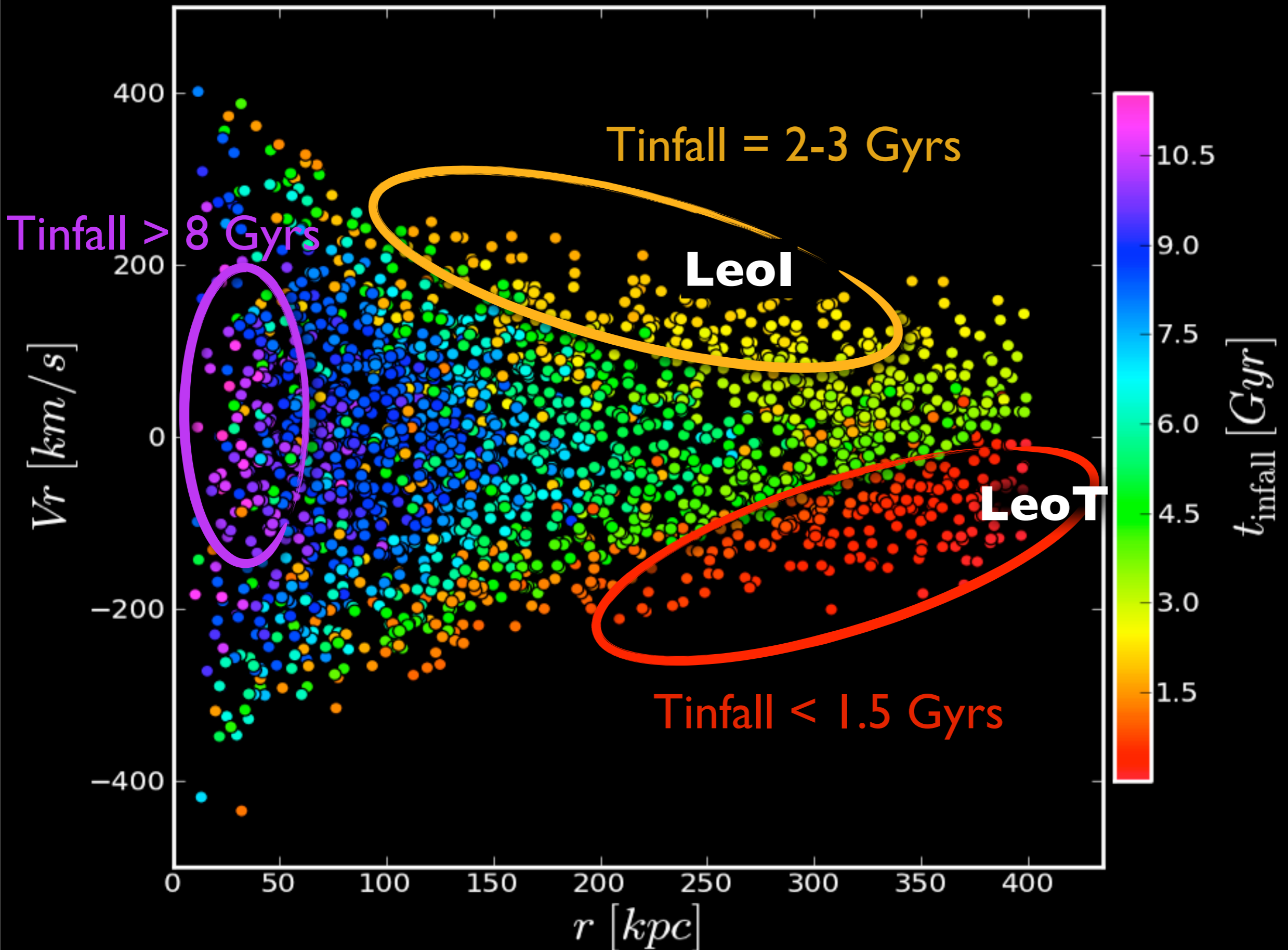
A correlation is visible in the r and V_r space
We know these for MW satellites!!



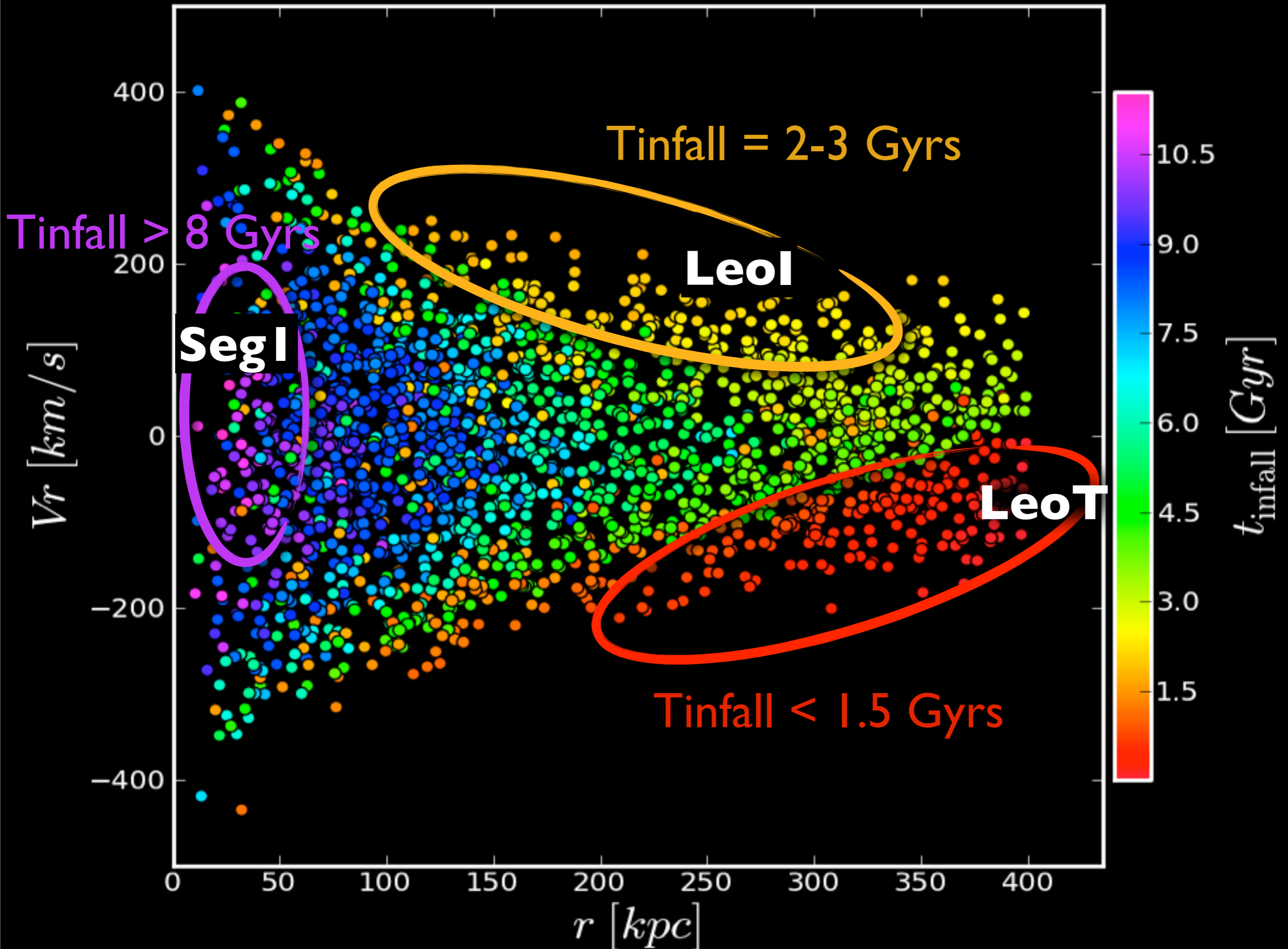
A correlation is visible in the r and V_r space
We know these for MW satellites!!



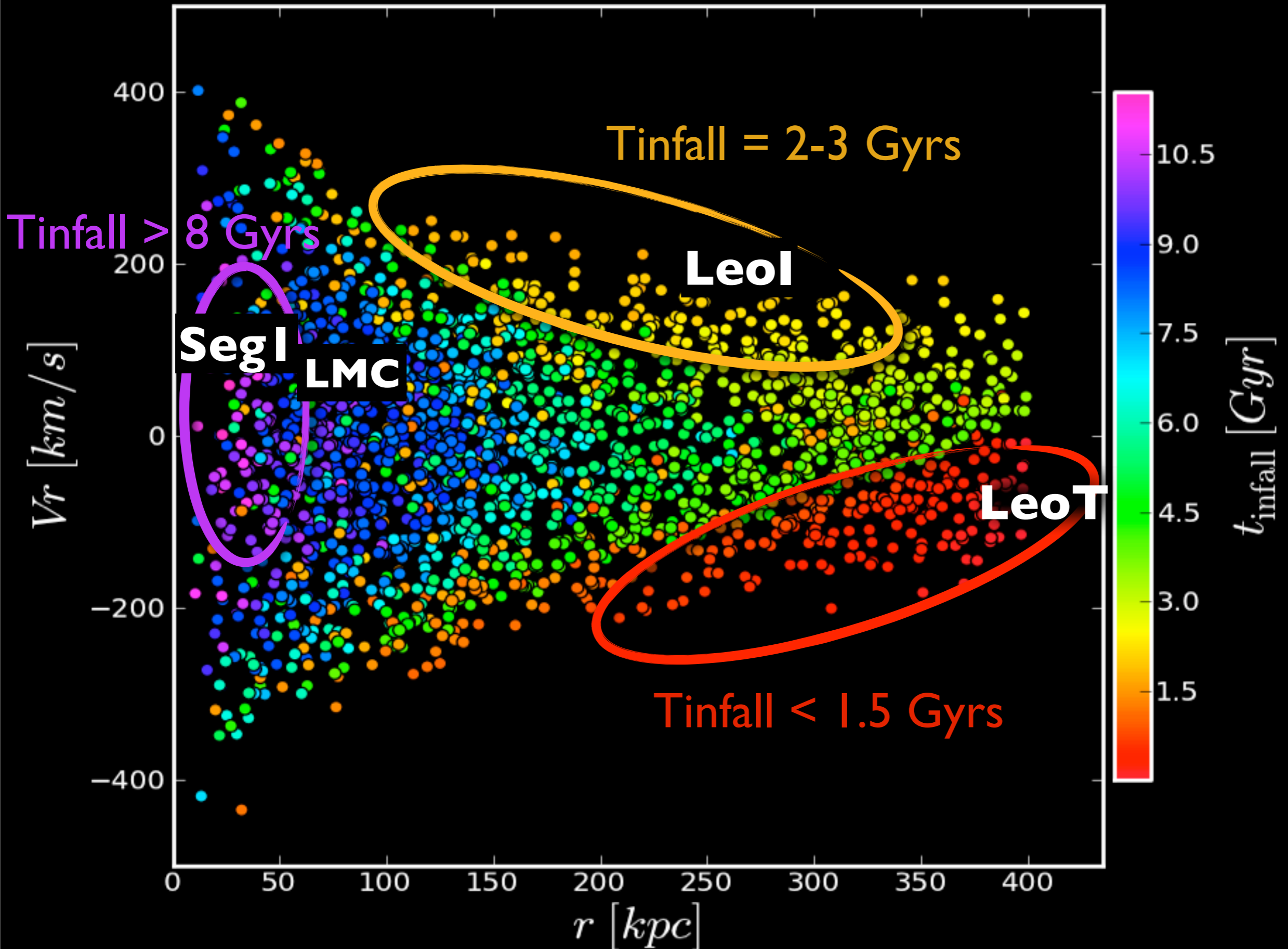
A correlation is visible in the r and V_r space
We know these for MW satellites!!



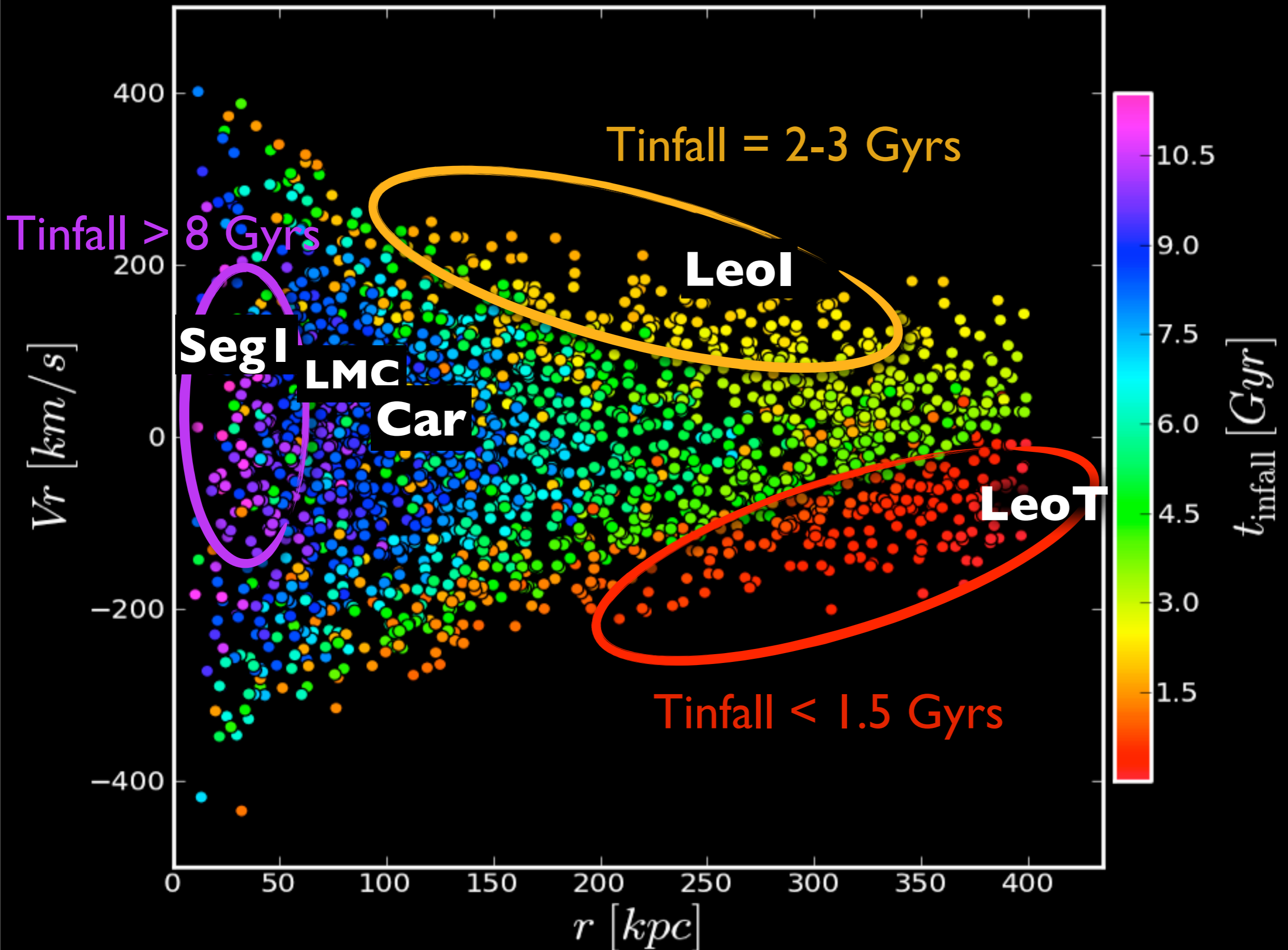
A correlation is visible in the r and V_r space
We know these for MW satellites!!



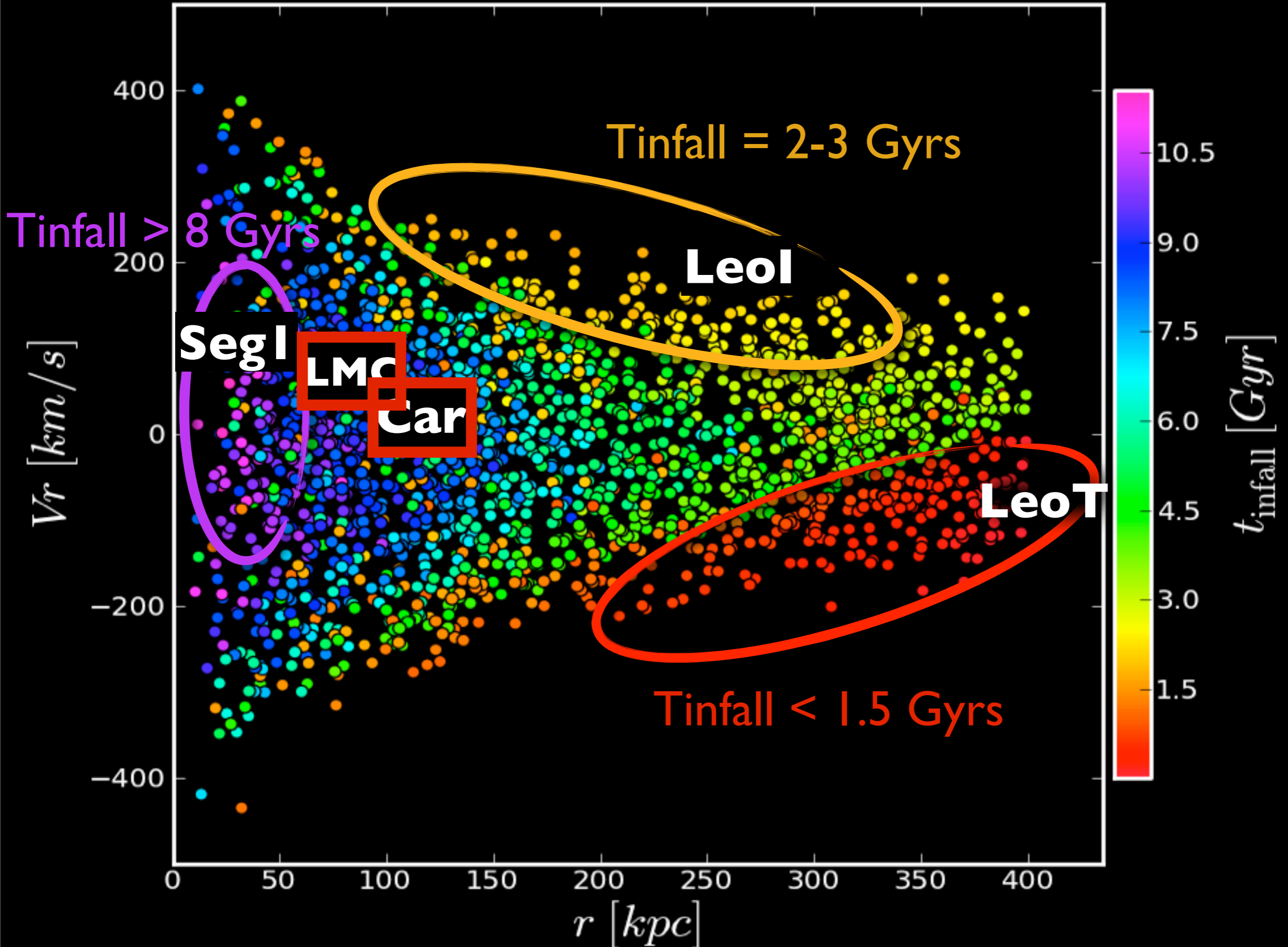
A correlation is visible in the r and V_r space
We know these for MW satellites!!



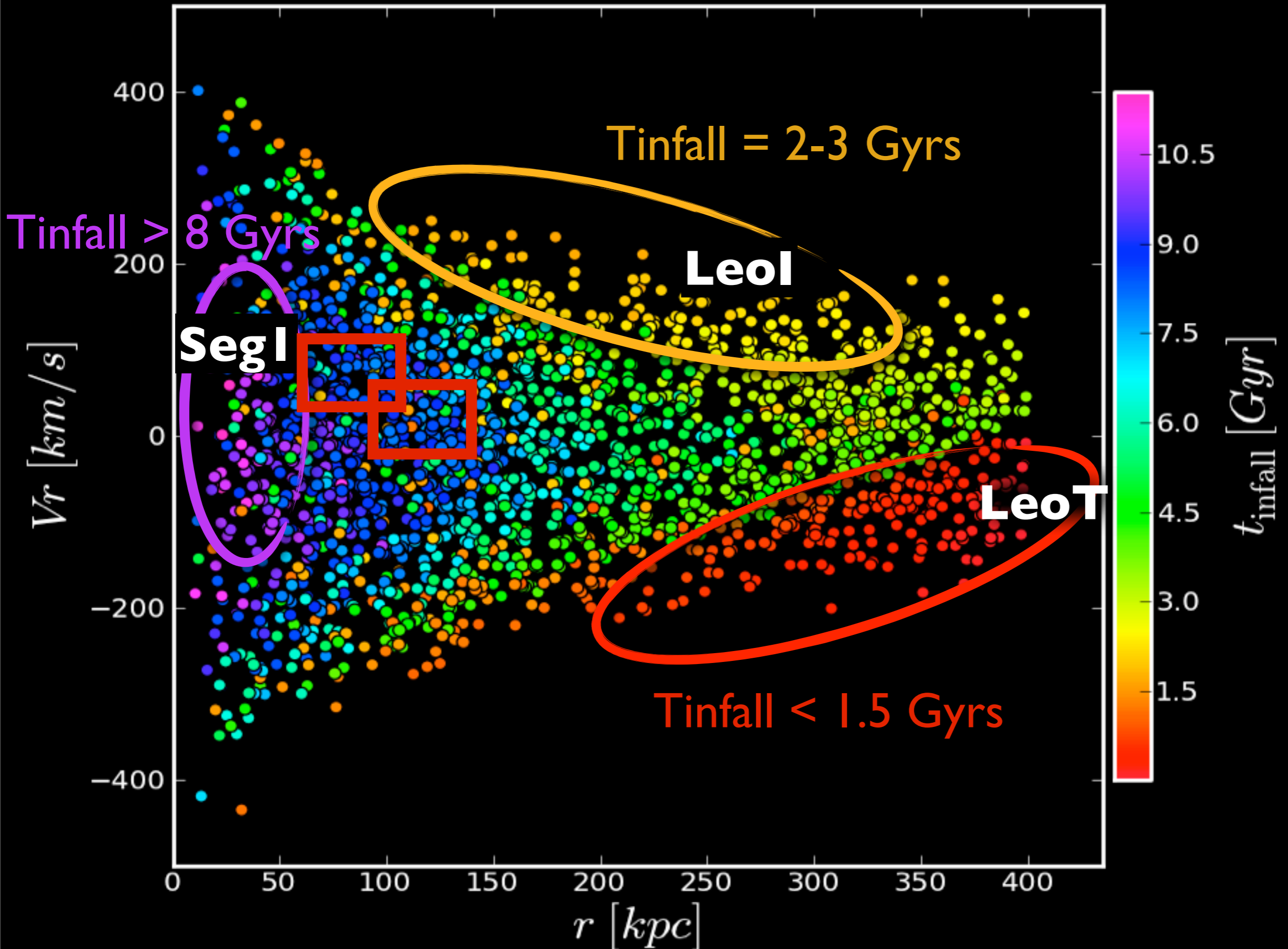
A correlation is visible in the r and V_r space
We know these for MW satellites!!



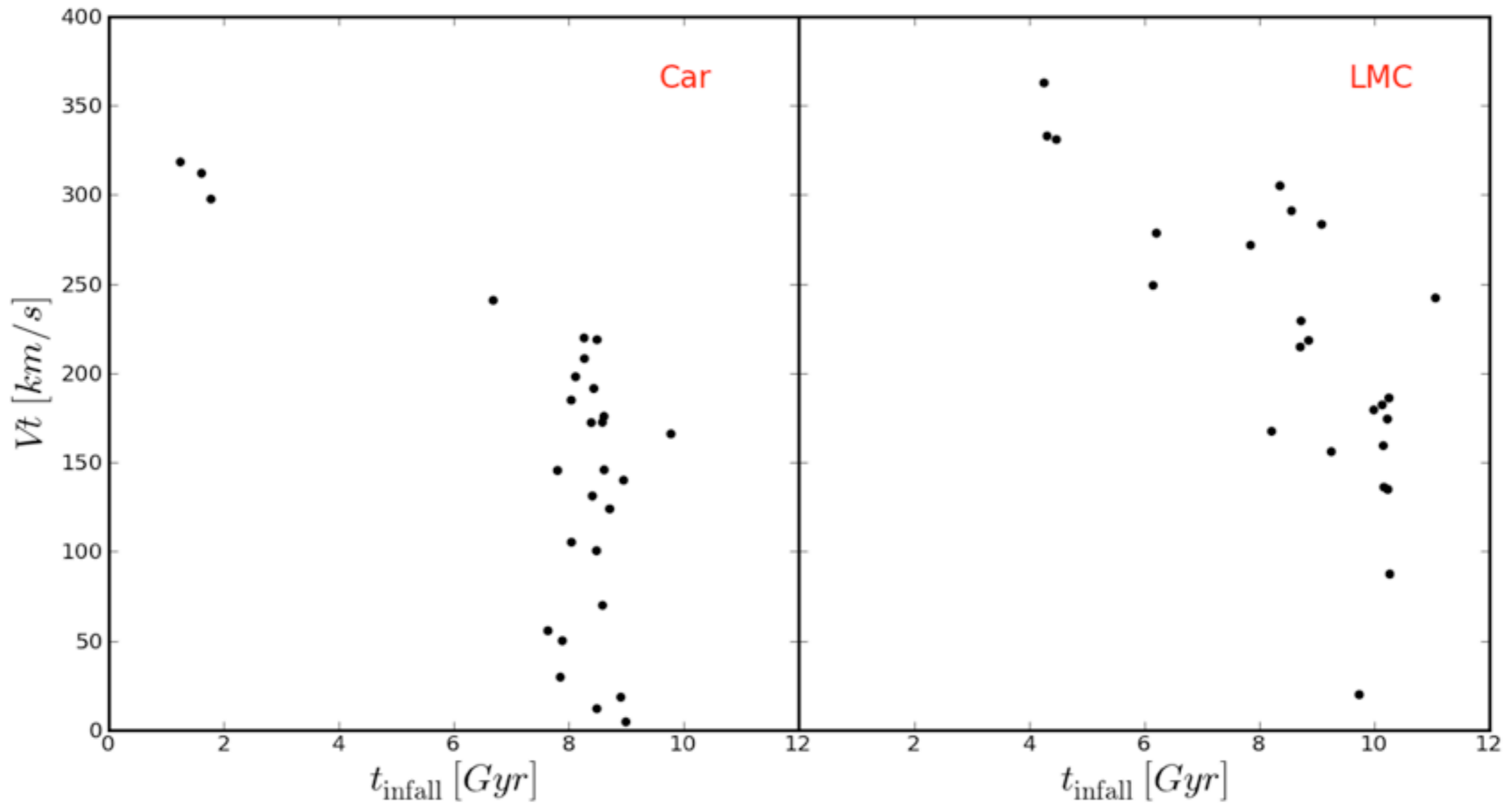
A correlation is visible in the r and V_r space
We know these for MW satellites!!



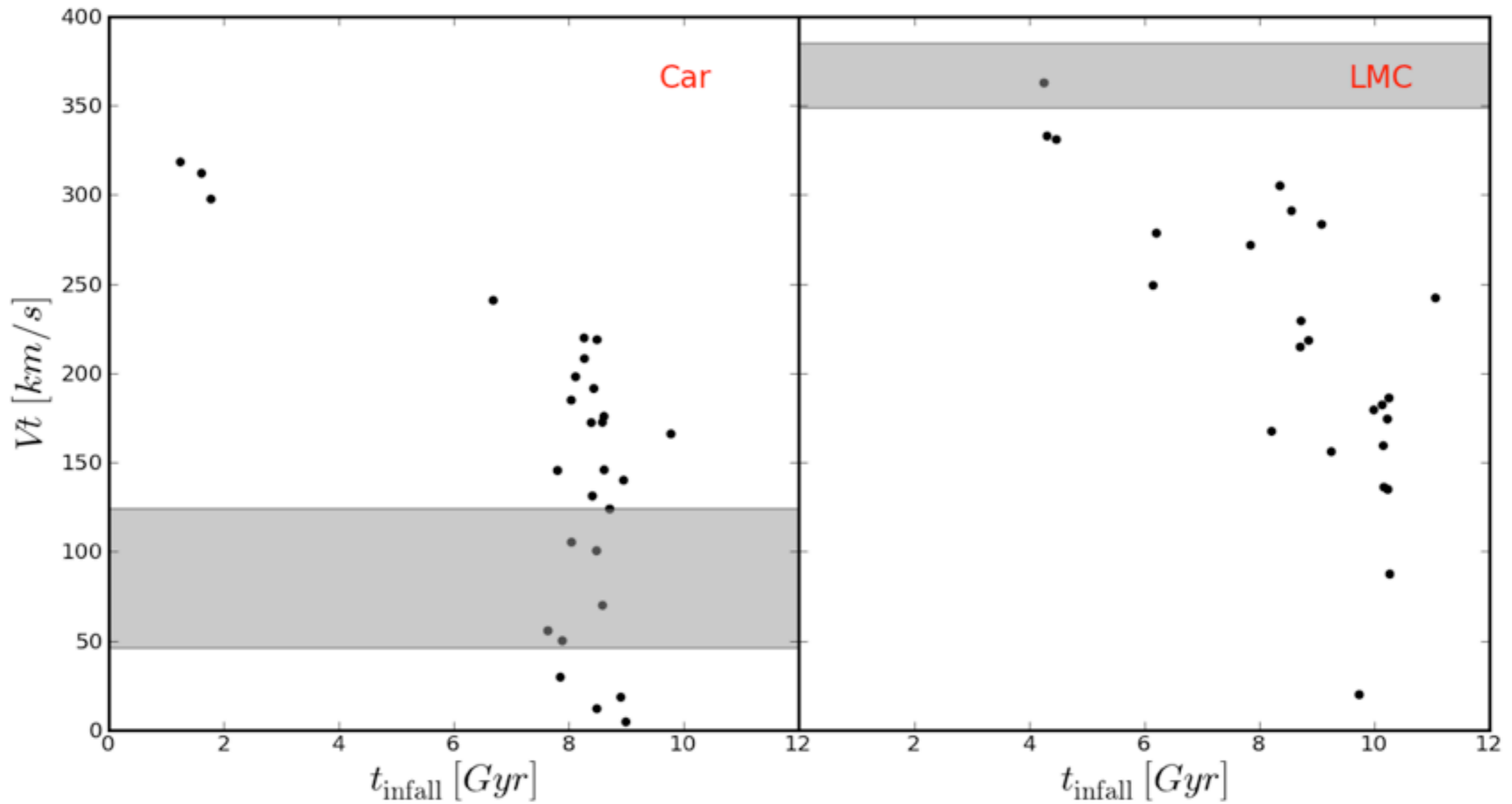
A correlation is visible in the r and V_r space
We know these for MW satellites!!

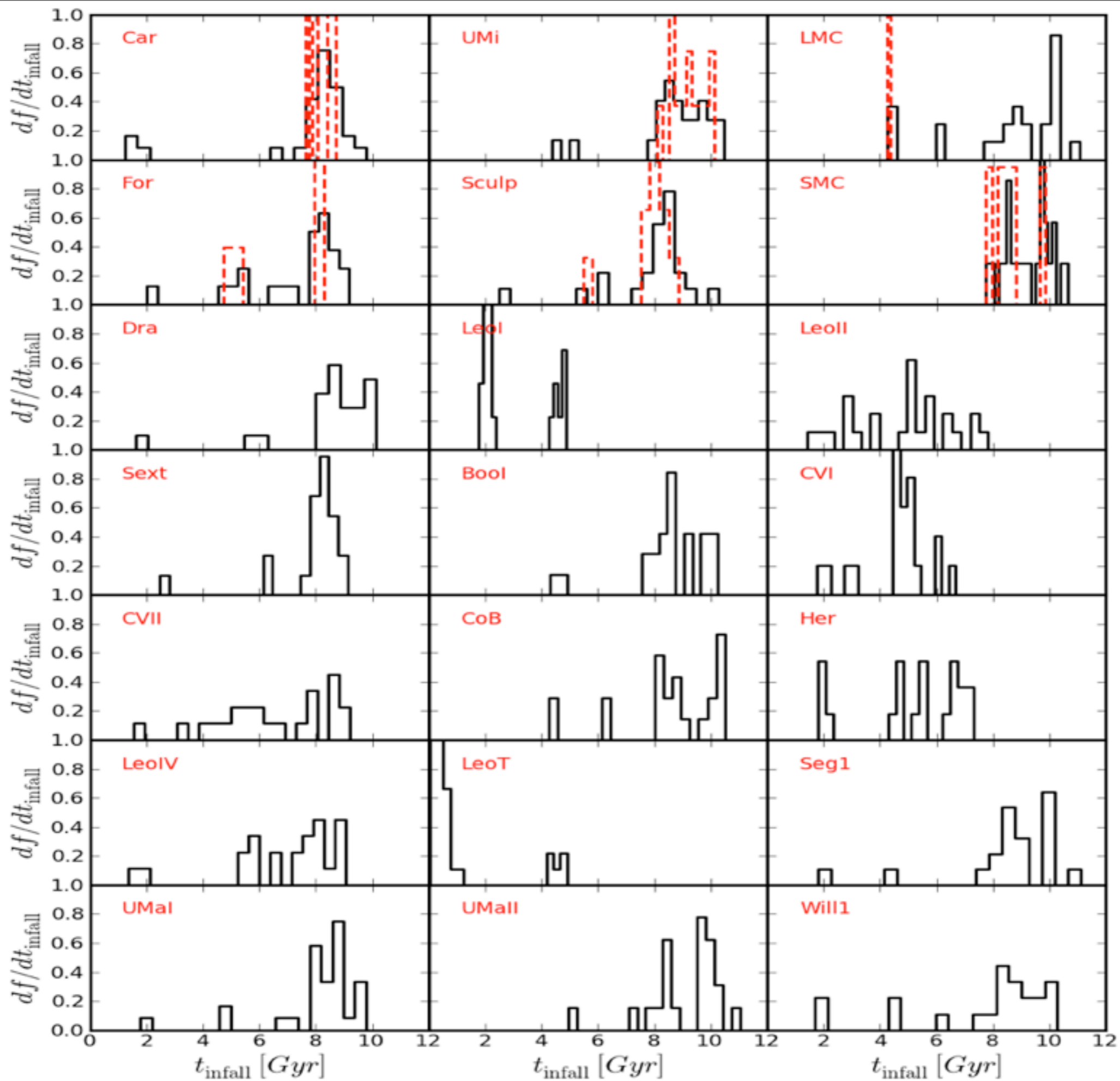


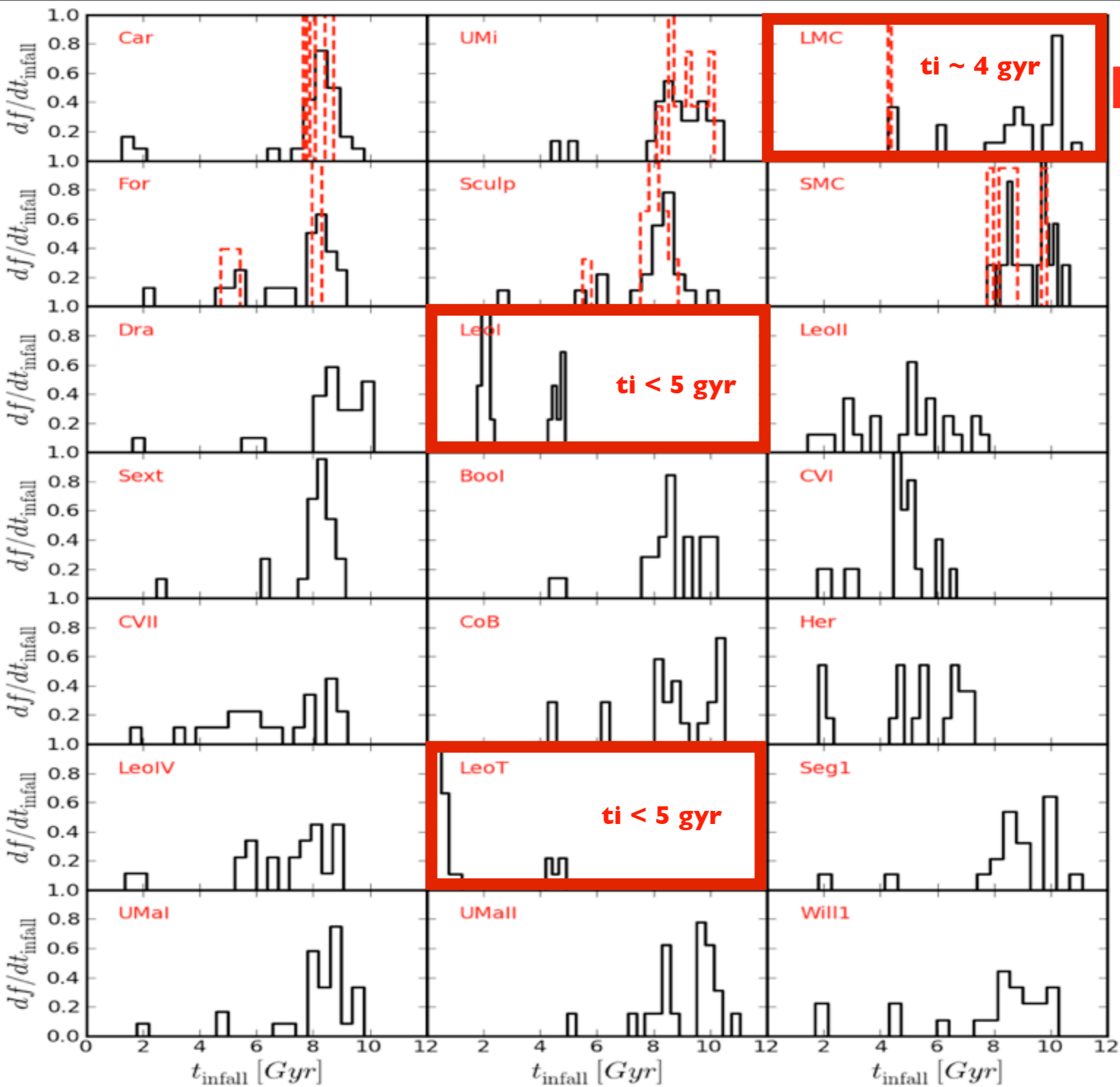
Halos with similar r and V_r



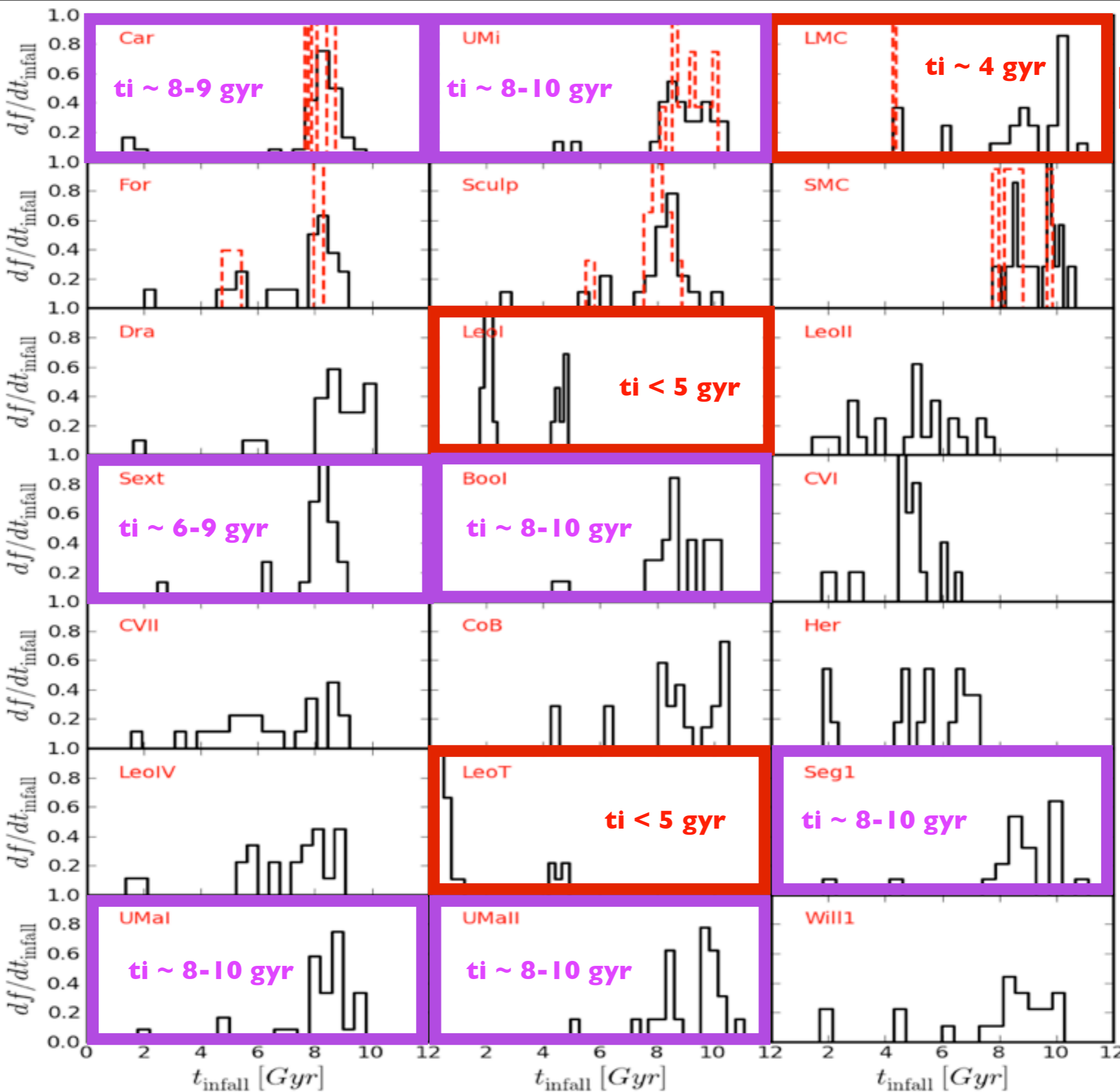
Halos with similar r and V_r + proper motions





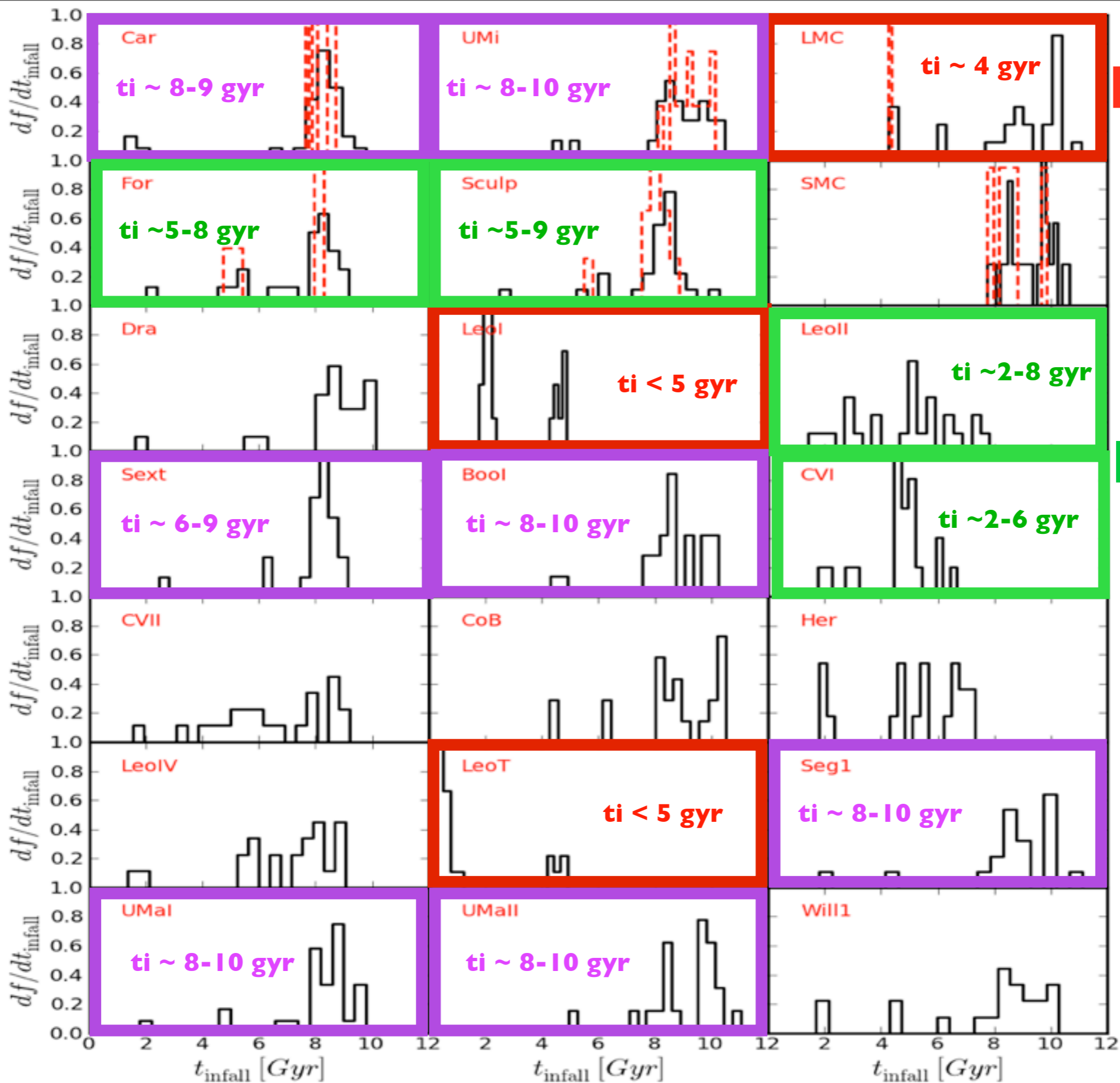


Recent



Recent

Early



Recent

Interim

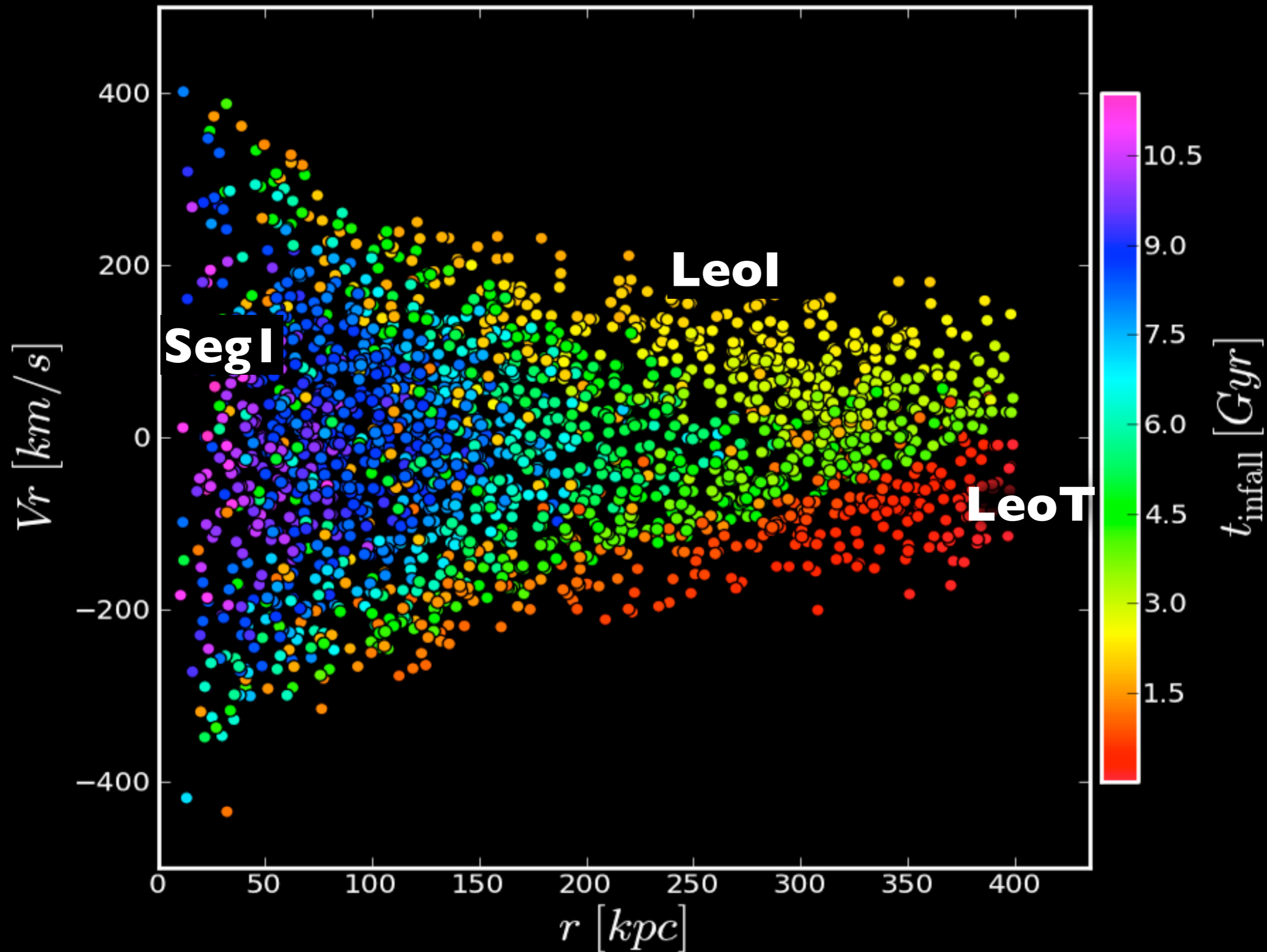
Early

How can this be
wrong?

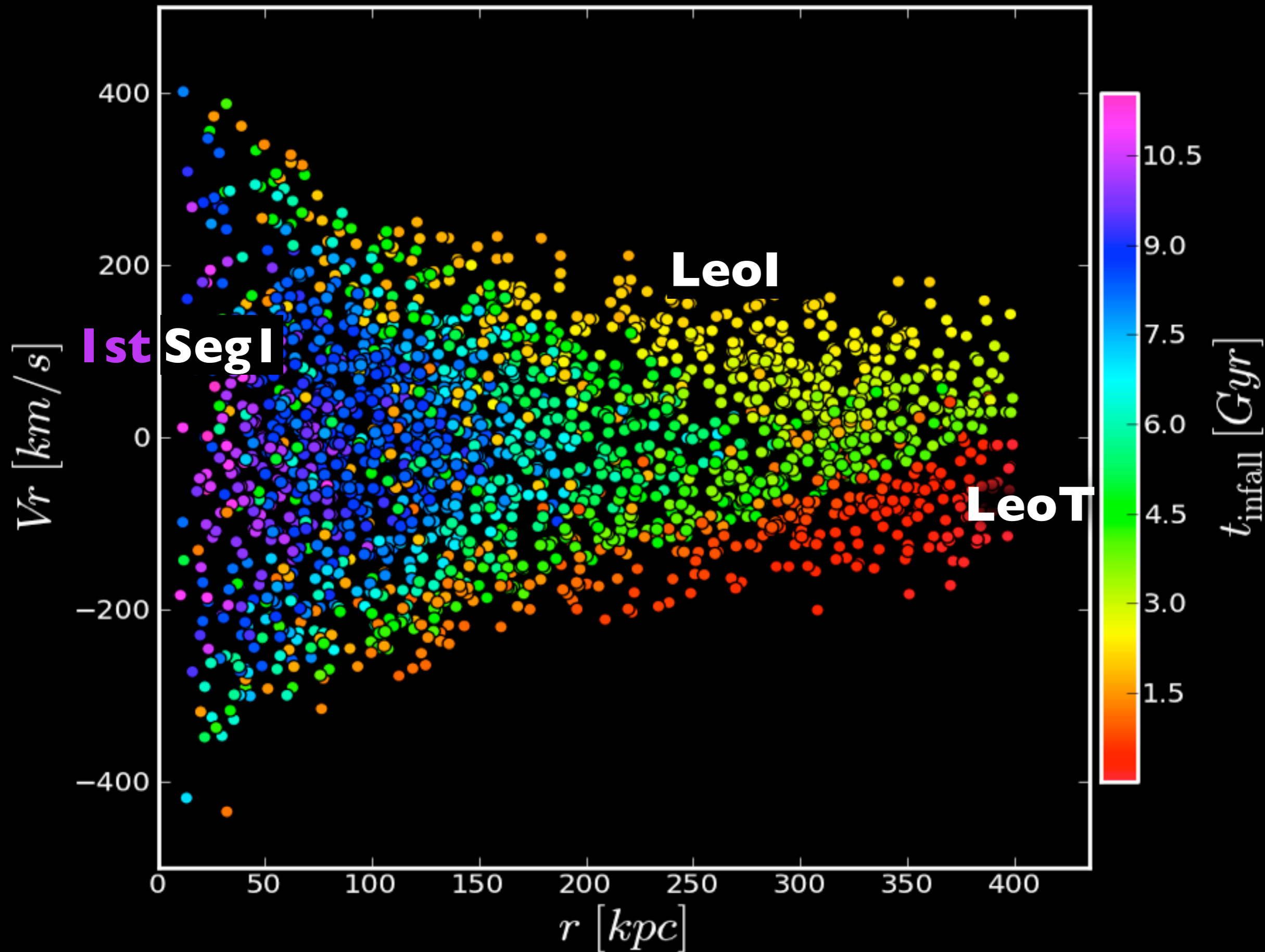
How can this be wrong?

- Maybe the MW Halo is very different than the VL2 host
- Gas physics missing. The formation of the disk would change the potential

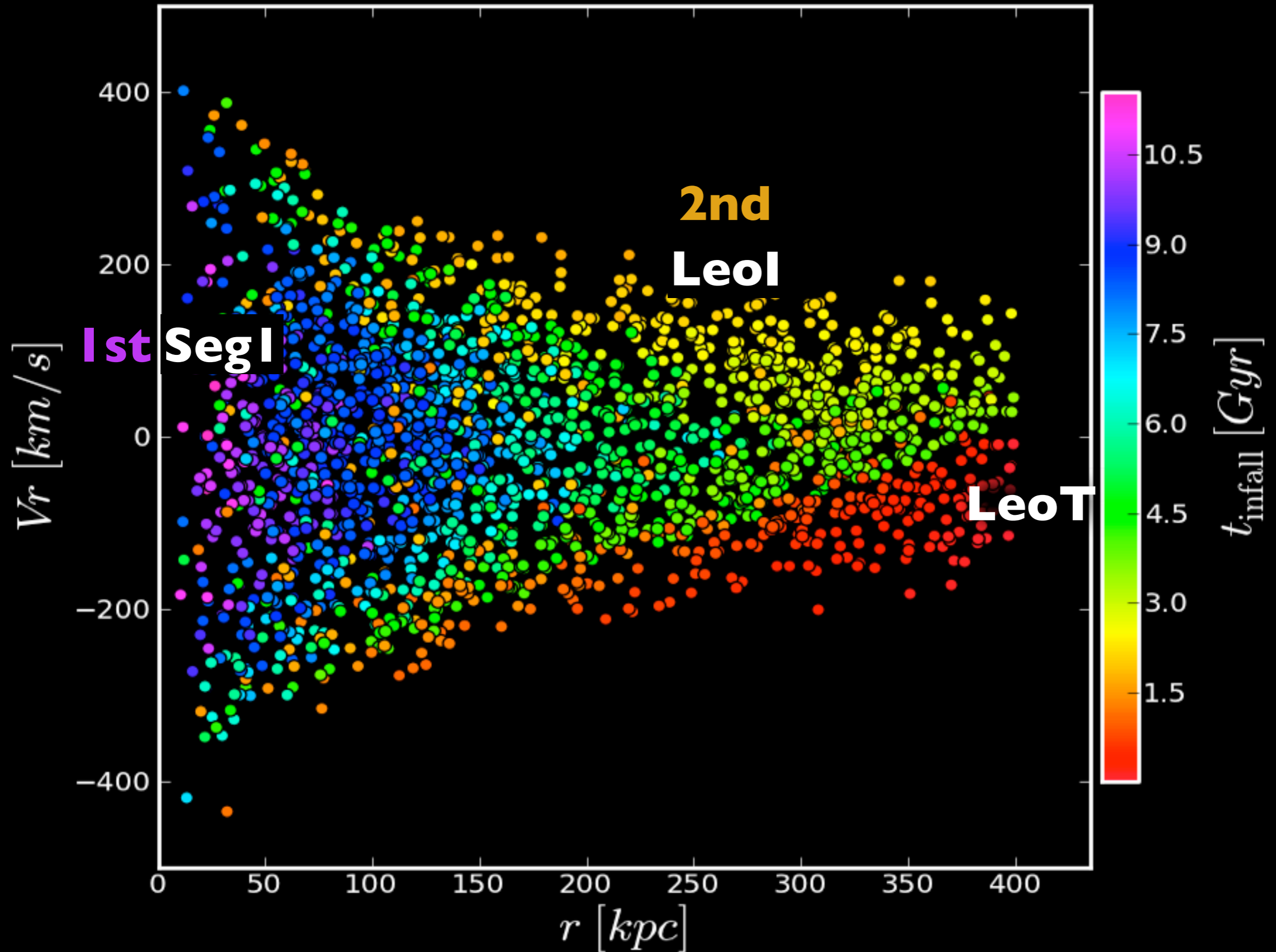
Some correlation is still visible with just r and V_r
We know these for MW satellites!!



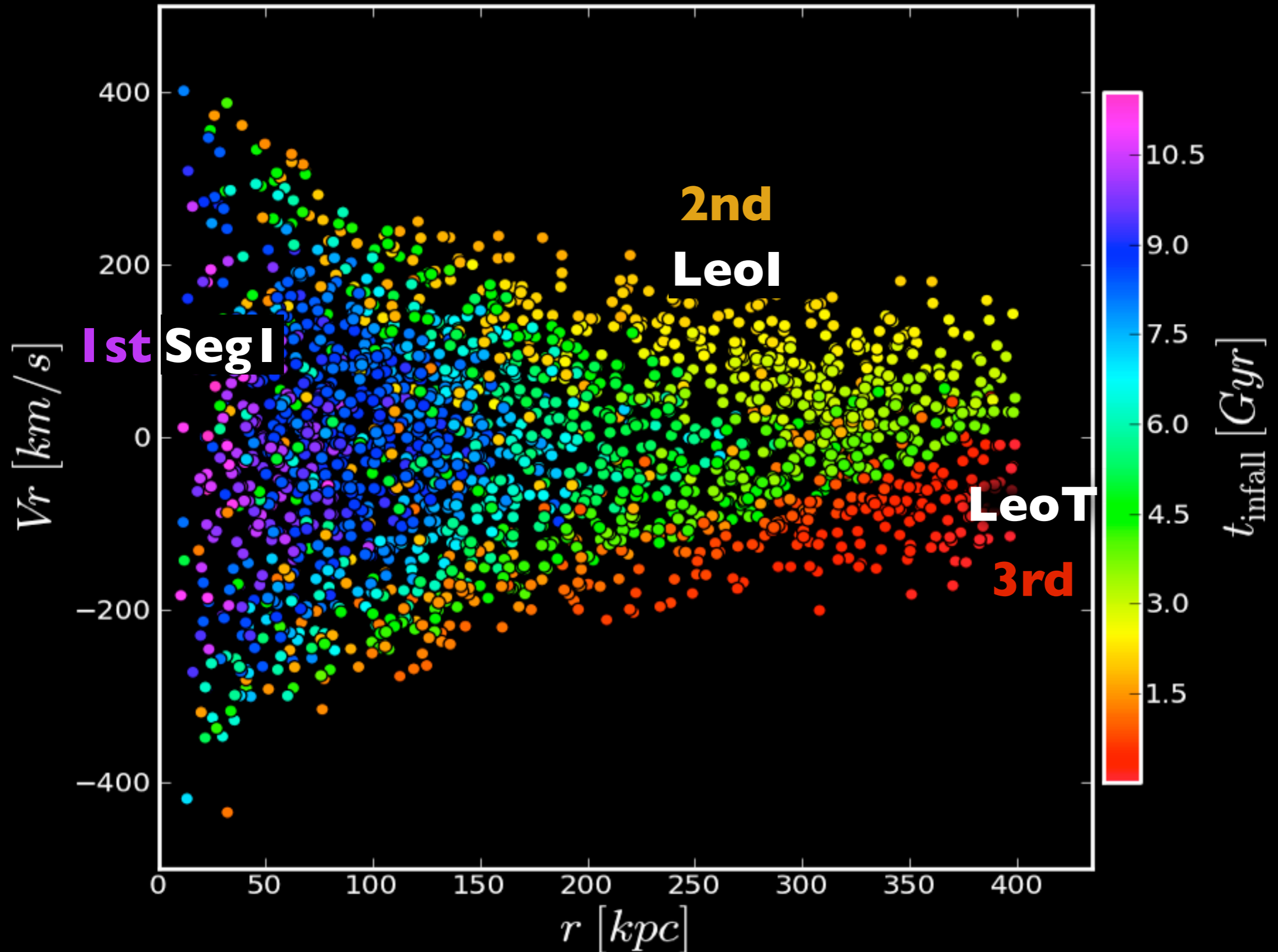
Some correlation is still visible with just r and V_r
We know these for MW satellites!!



Some correlation is still visible with just r and V_r
We know these for MW satellites!!

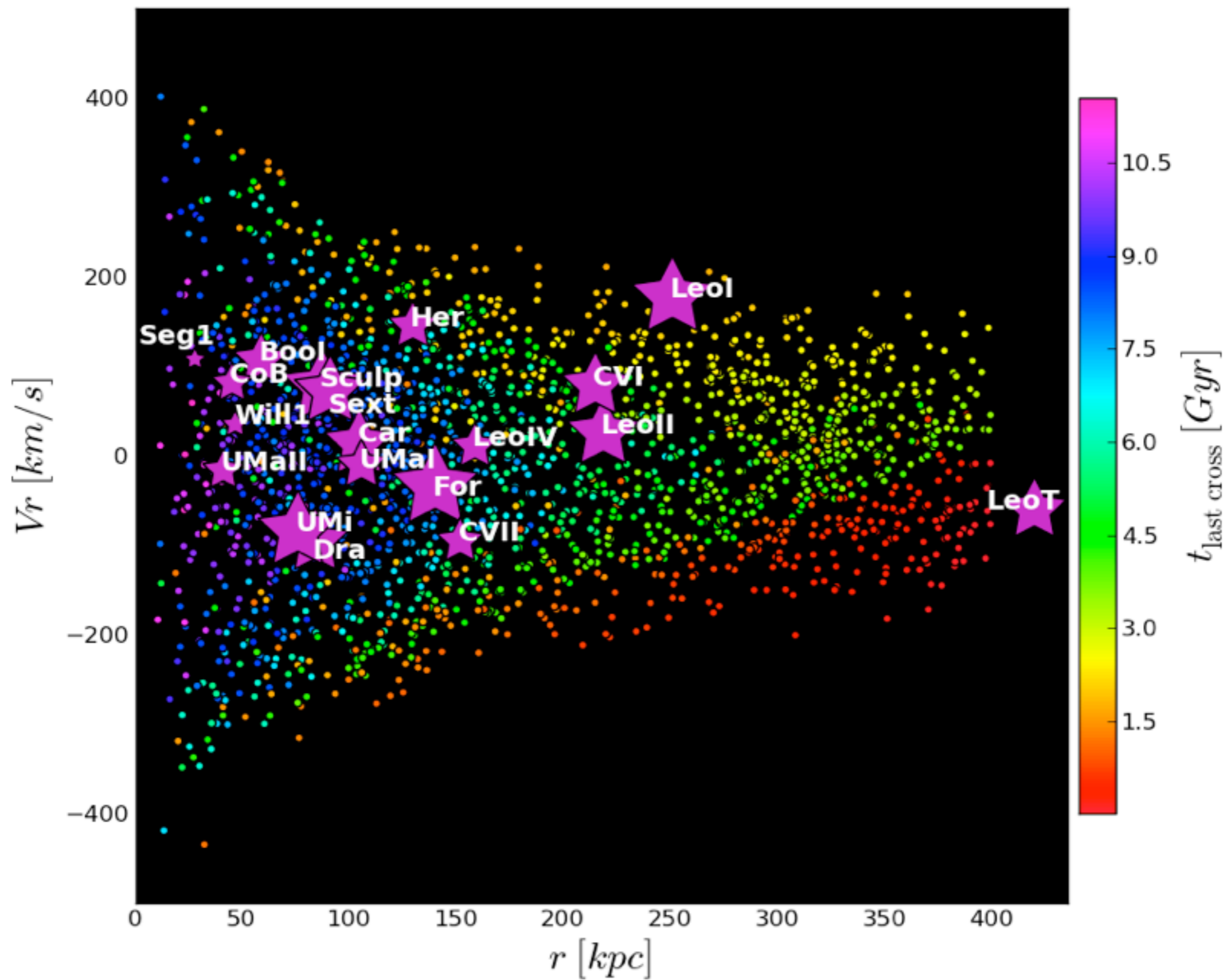


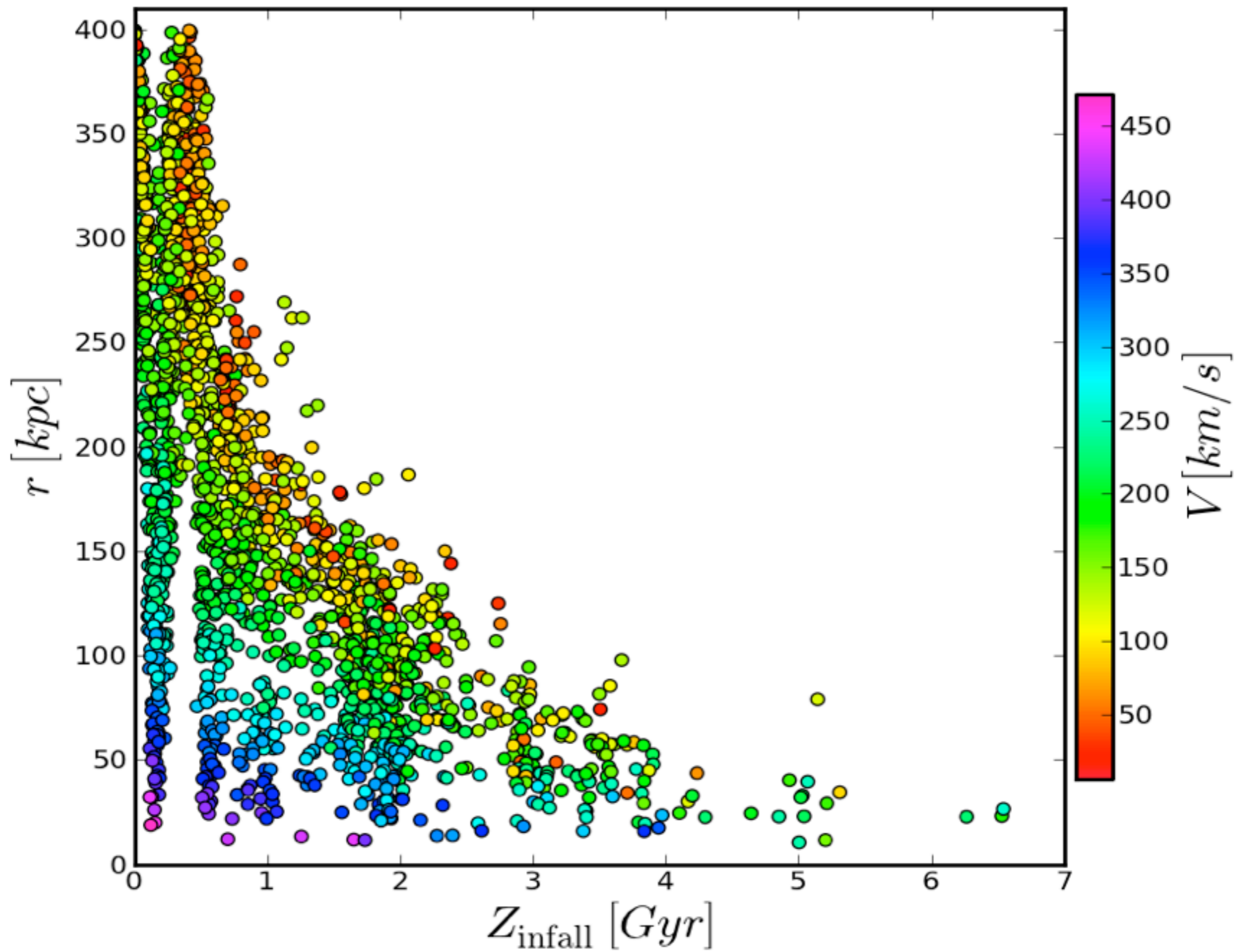
Some correlation is still visible with just r and V_r
We know these for MW satellites!!



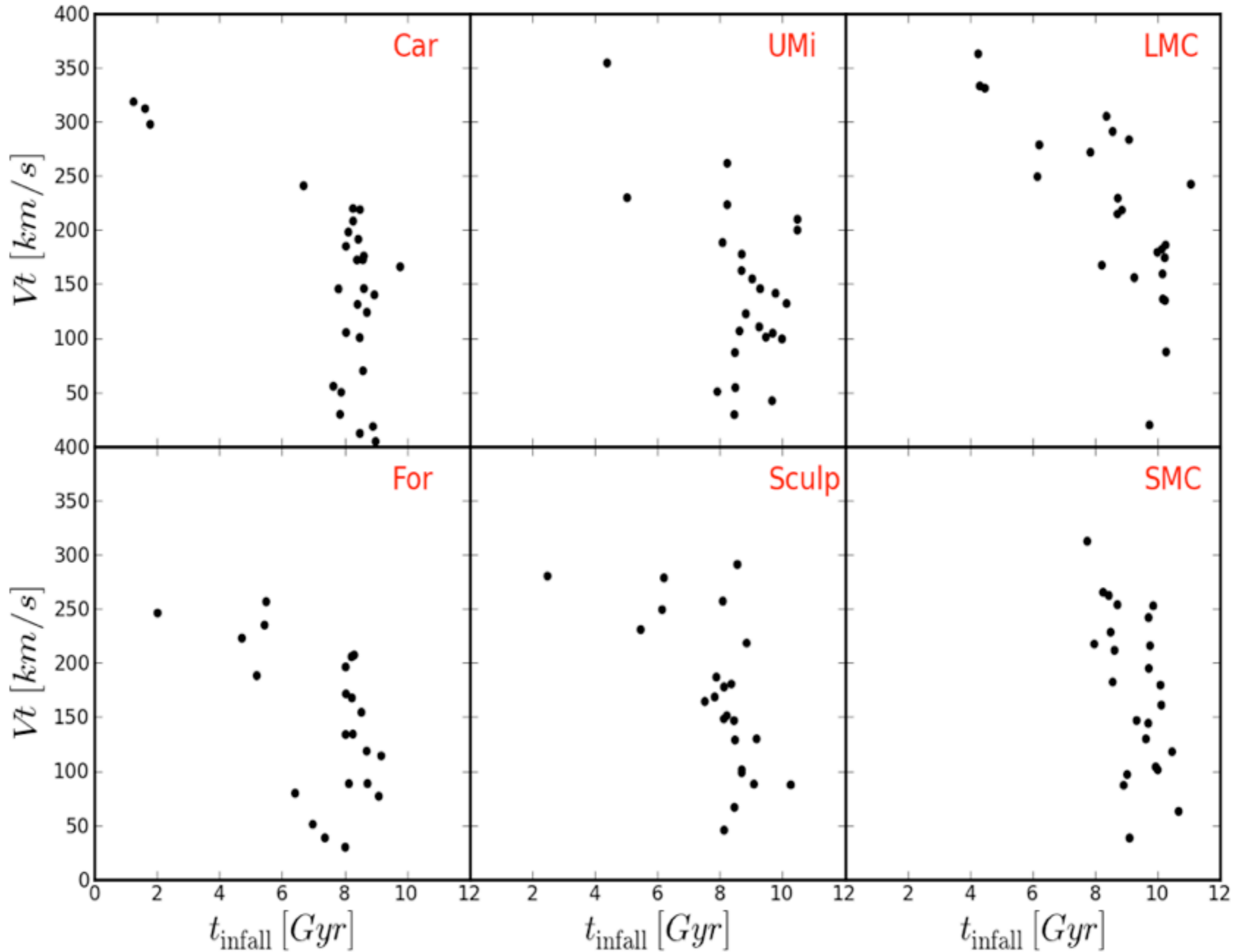
Conclusions

- Cosmological simulations predict a relationship between the orbital energy of bound subhalos and the time they got accreted to their host.
- With future proper motion observations and more data from similar and better simulations (Hyades, Aquarius, Mini Bolshoi, etc ..), we will get better estimates on the accretion times of MW satellite galaxies.

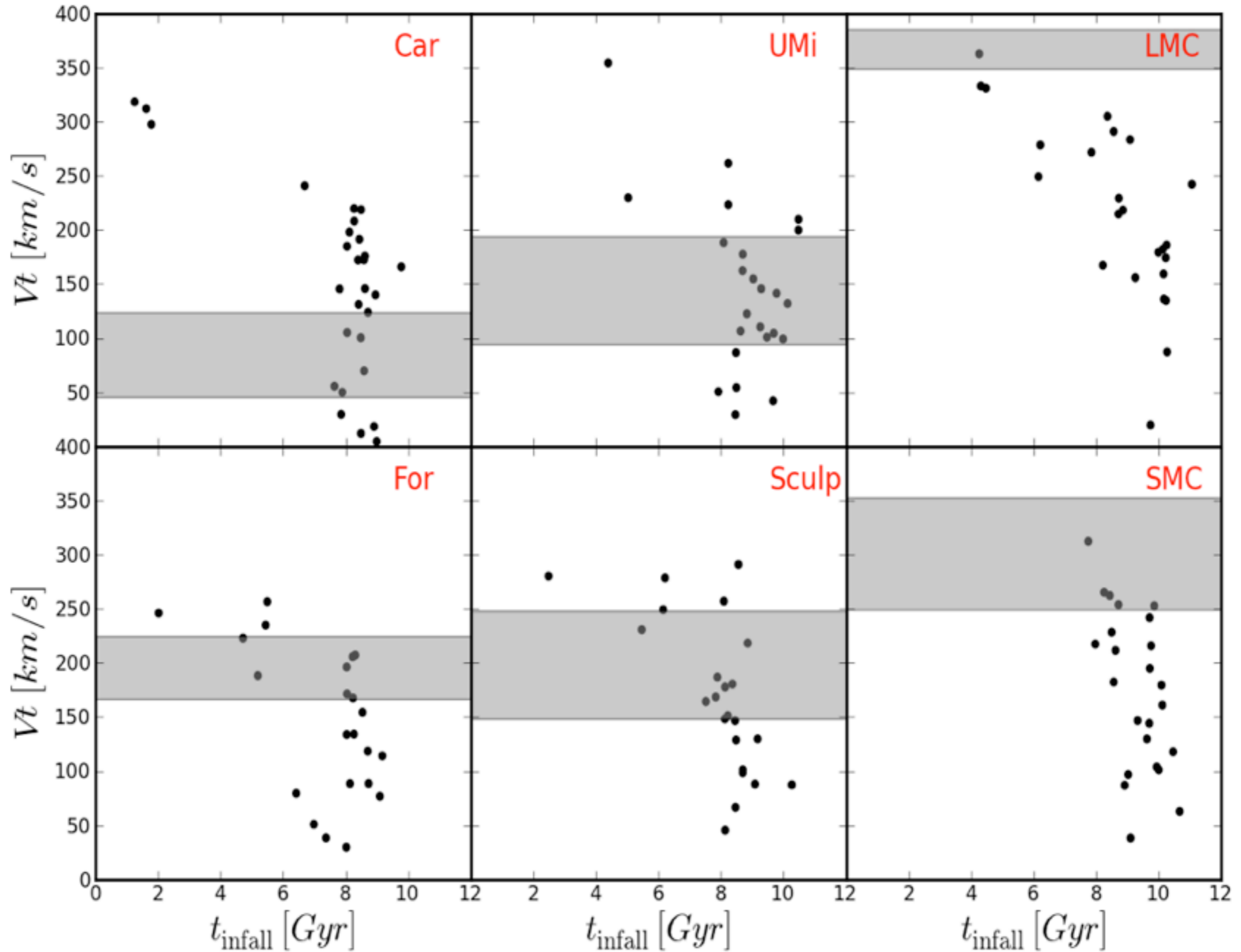




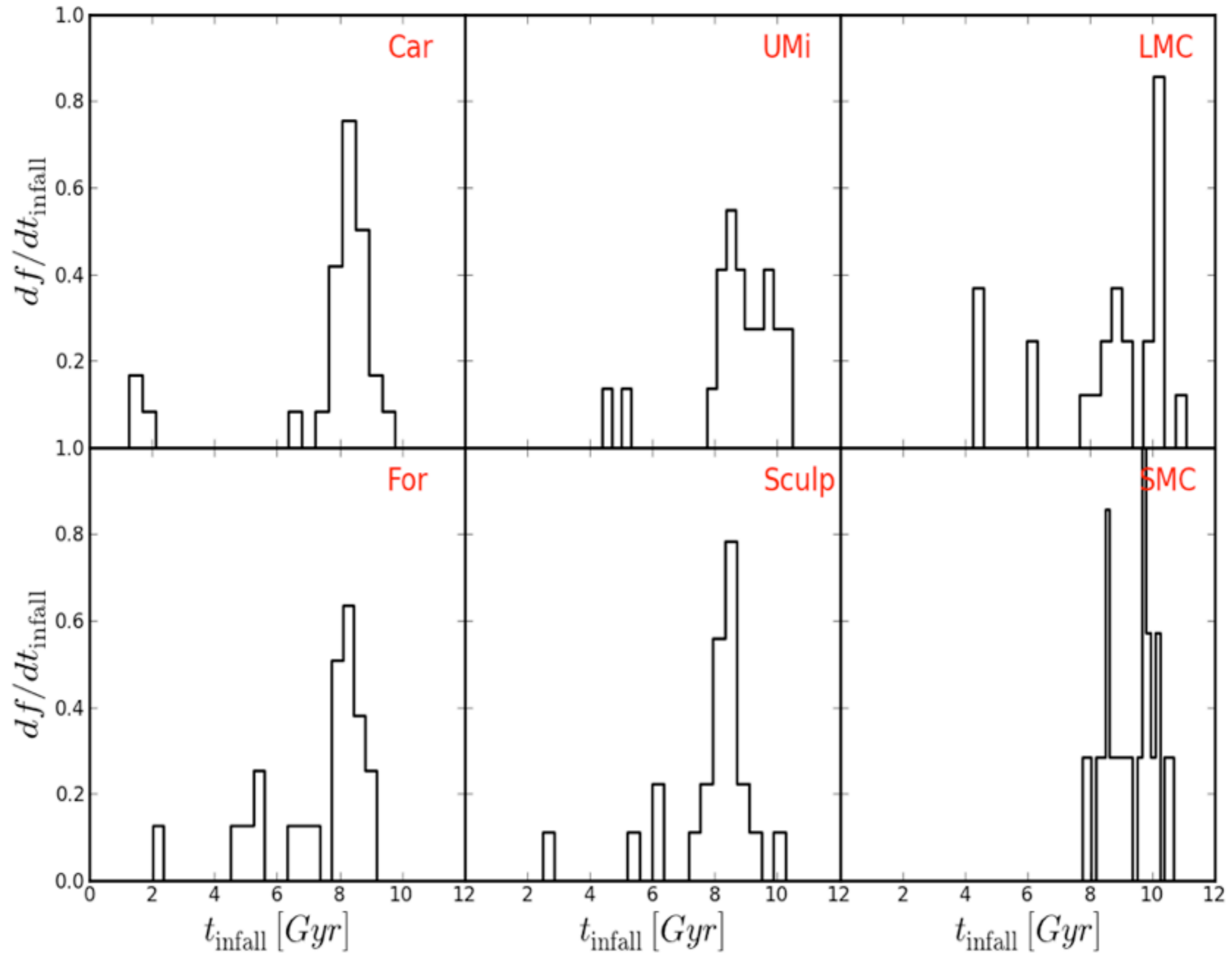
Halos with similar r and V_r : infall times still ambiguous



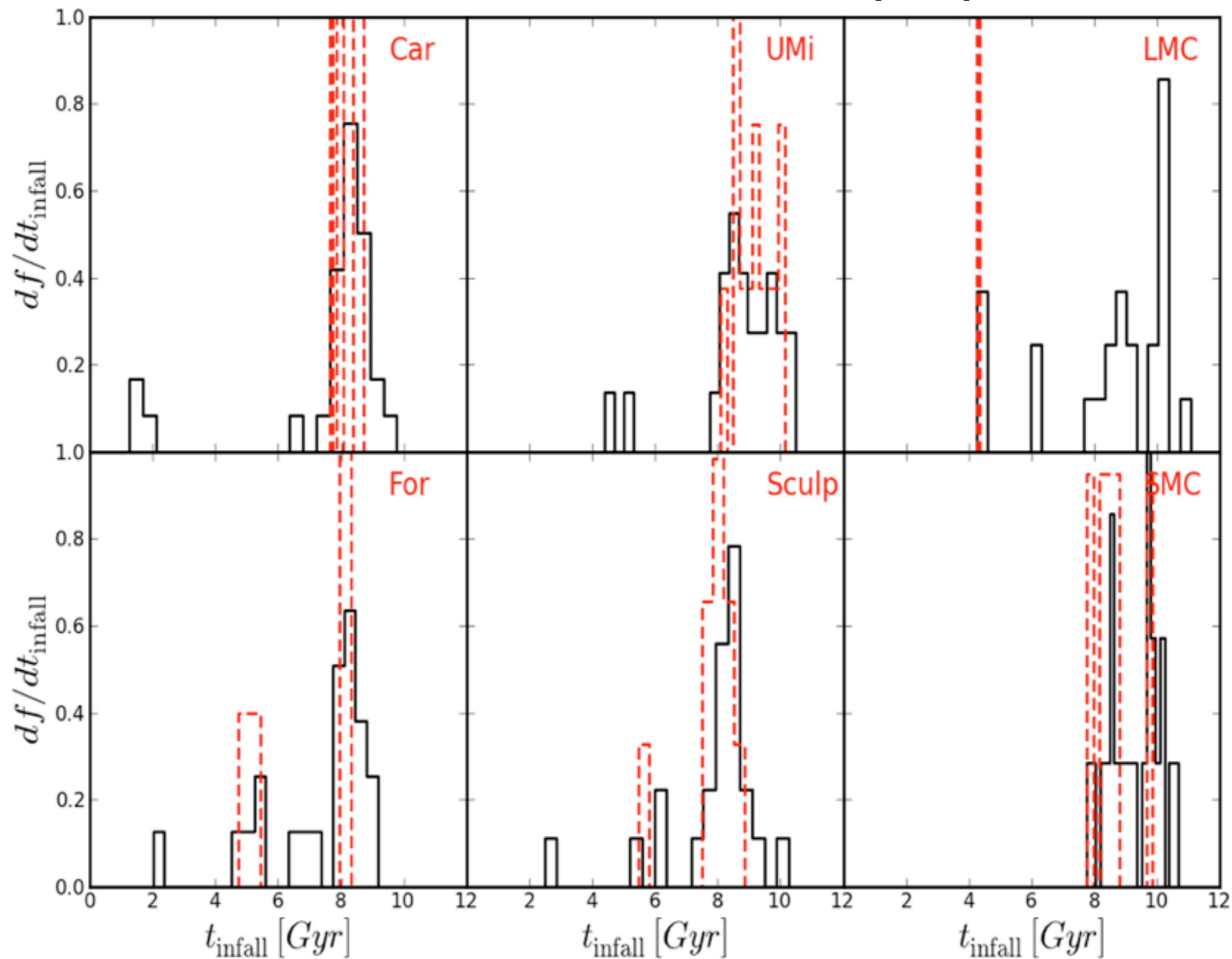
Halos with similar r and V_r : we need proper motions!!



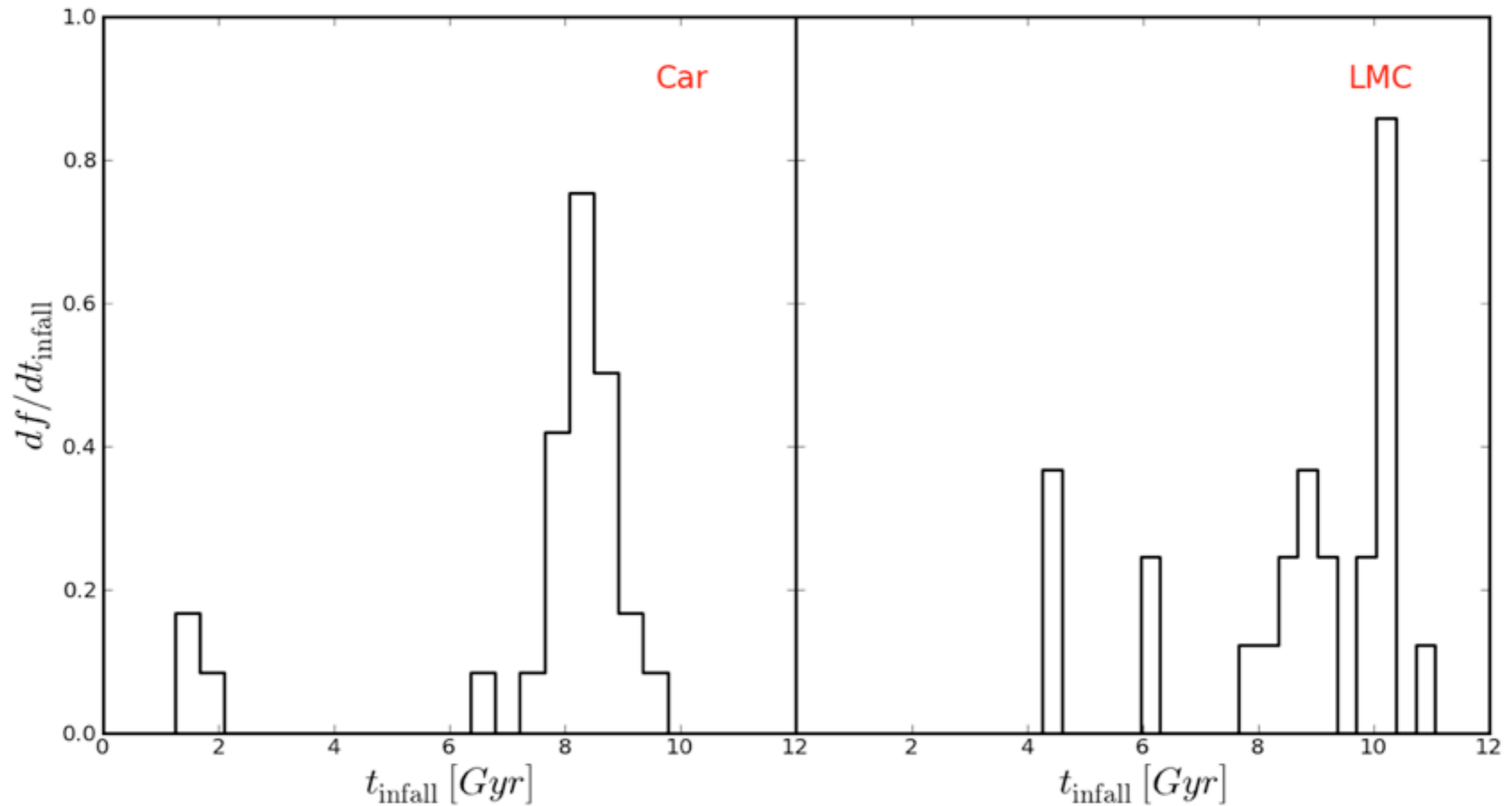
Halos with similar r and V_r : infall times still ambiguous



Halos with similar r and V_r : we need proper motions!!



Subhalos with similar r and V_r : infall times still ambiguous



Subhalos with similar r and V_r : we really need proper motions!!

