STAR FORMATION IN SATELLITE GALAXIES

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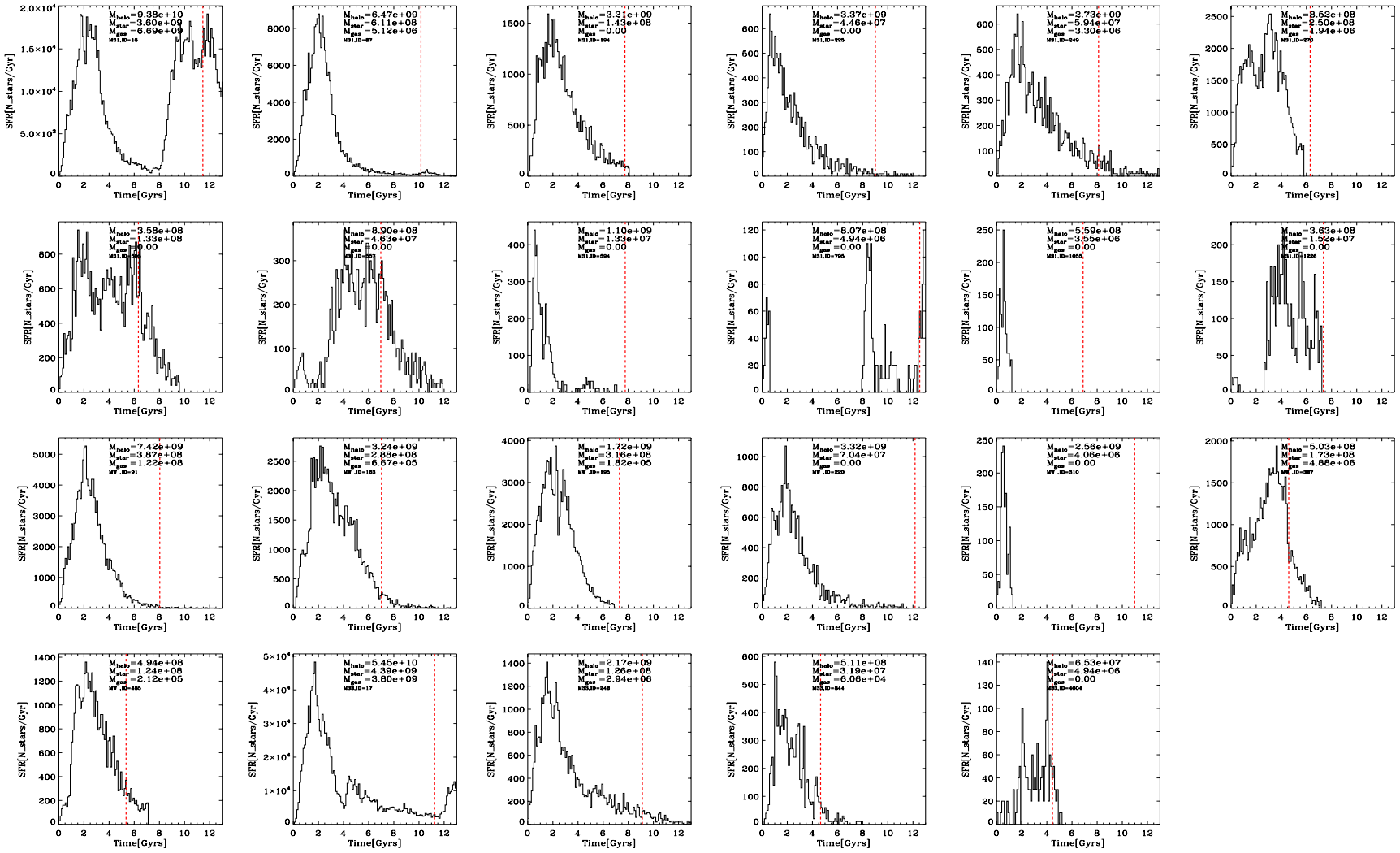
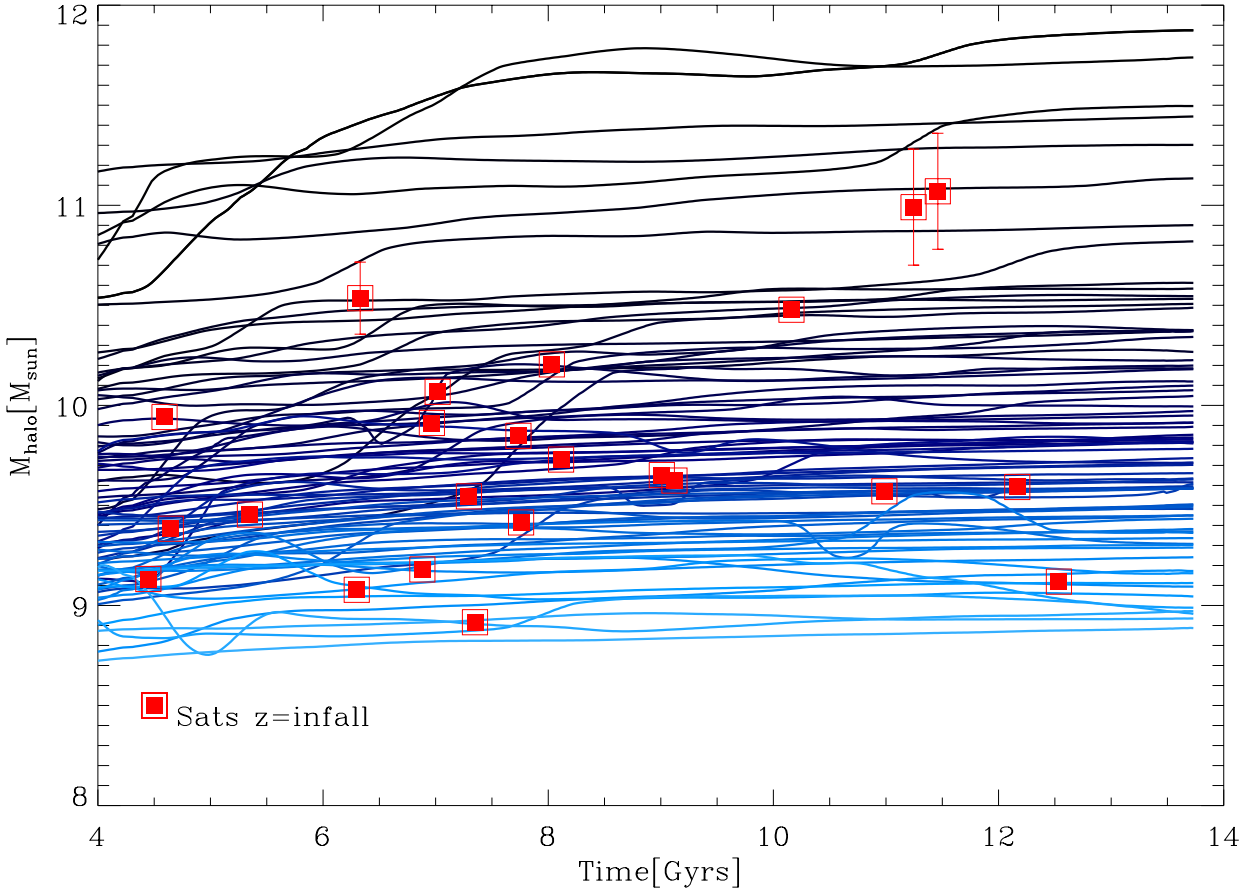
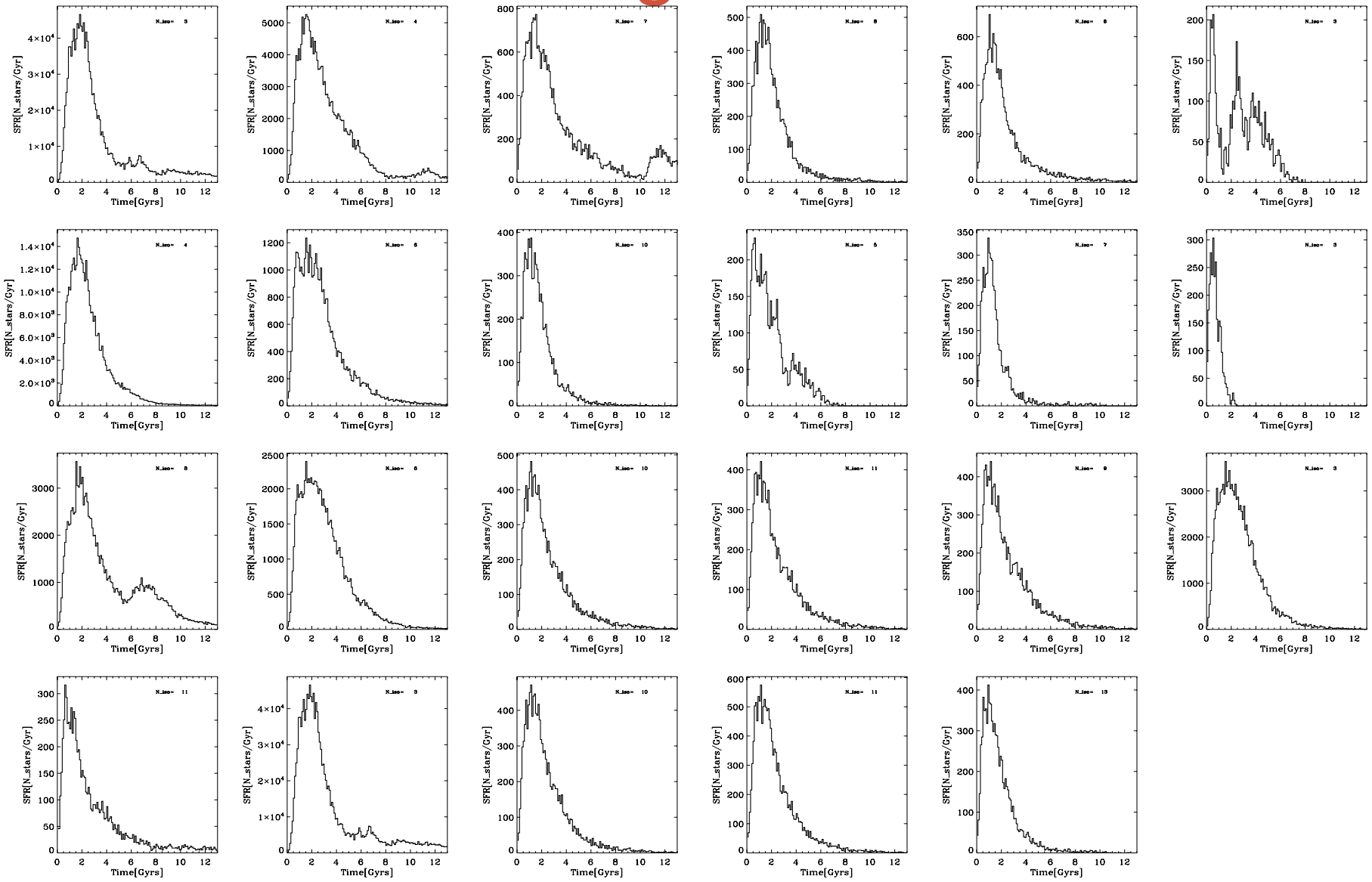
SFHs of satellites with $M_{vir,inf}$>10^9M_{sun}



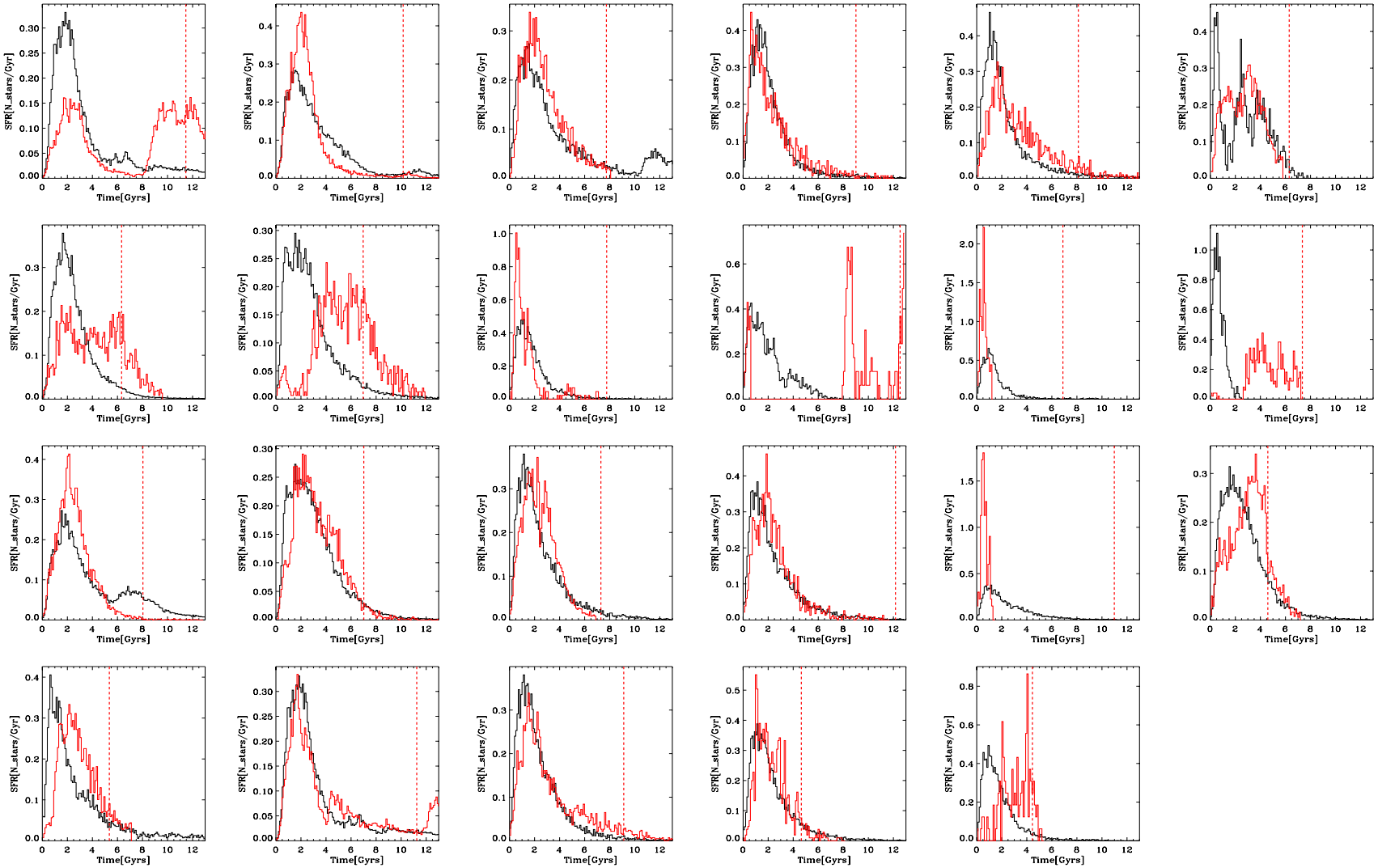
Comparison to isolated galaxies



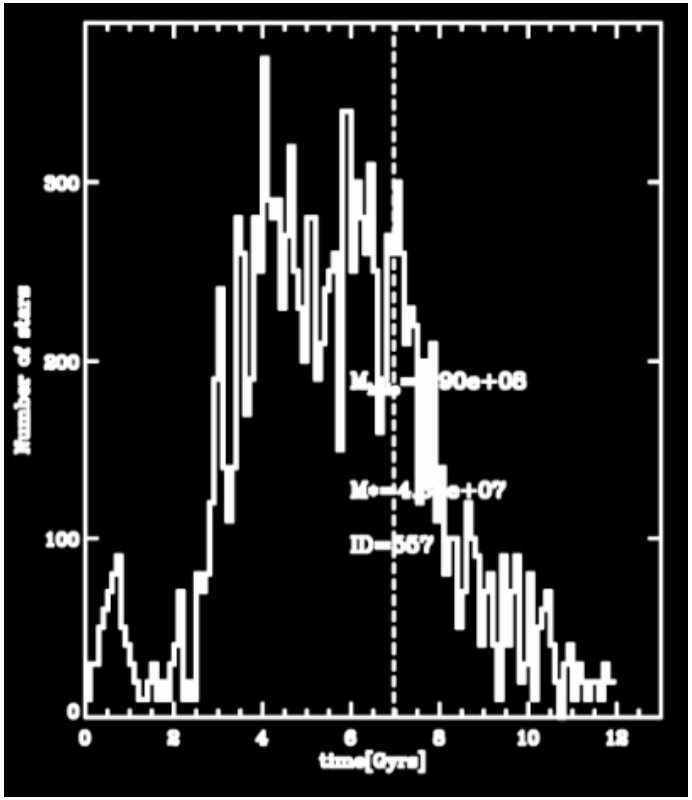
SFHs of isolated galaxies



Comparison



Stars formed before and after infall



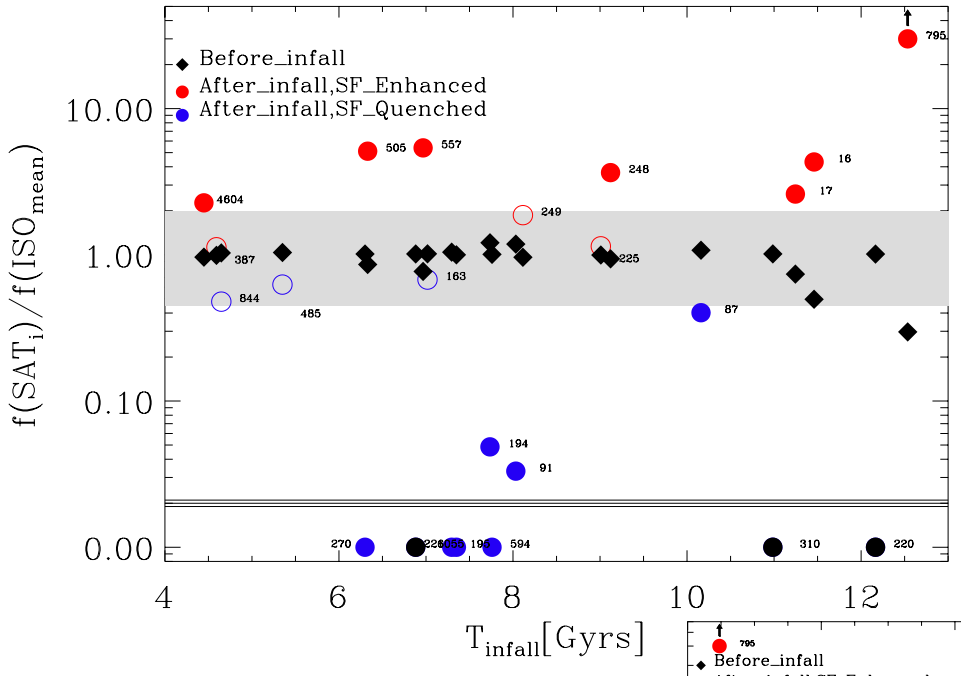
$$\bar{f}_j = \frac{f_j}{\Delta T_j \times 2 \times \bar{f}}$$

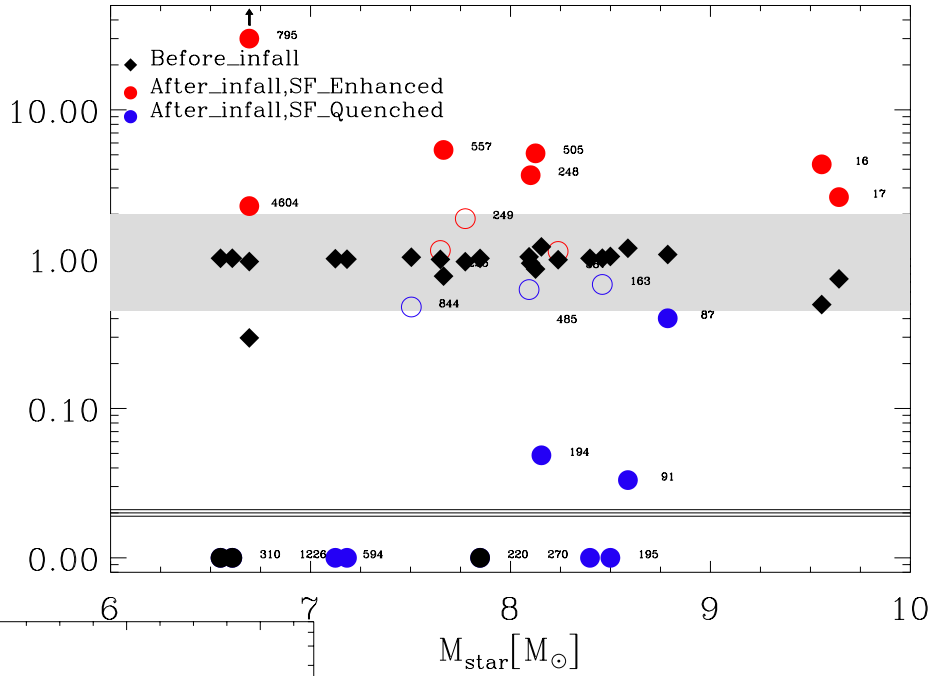
$$\bar{f} = \left(\frac{f_{before}}{\Delta T_{before}} + \frac{f_{after}}{\Delta T_{after}}\right)/2$$

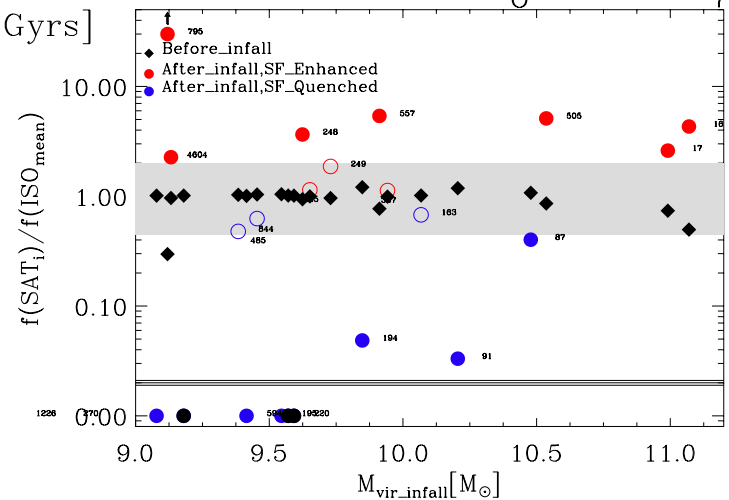
$$\bar{f}_{before} + \bar{f}_{after} = 1$$

ΔT_{before} ΔT_{after}

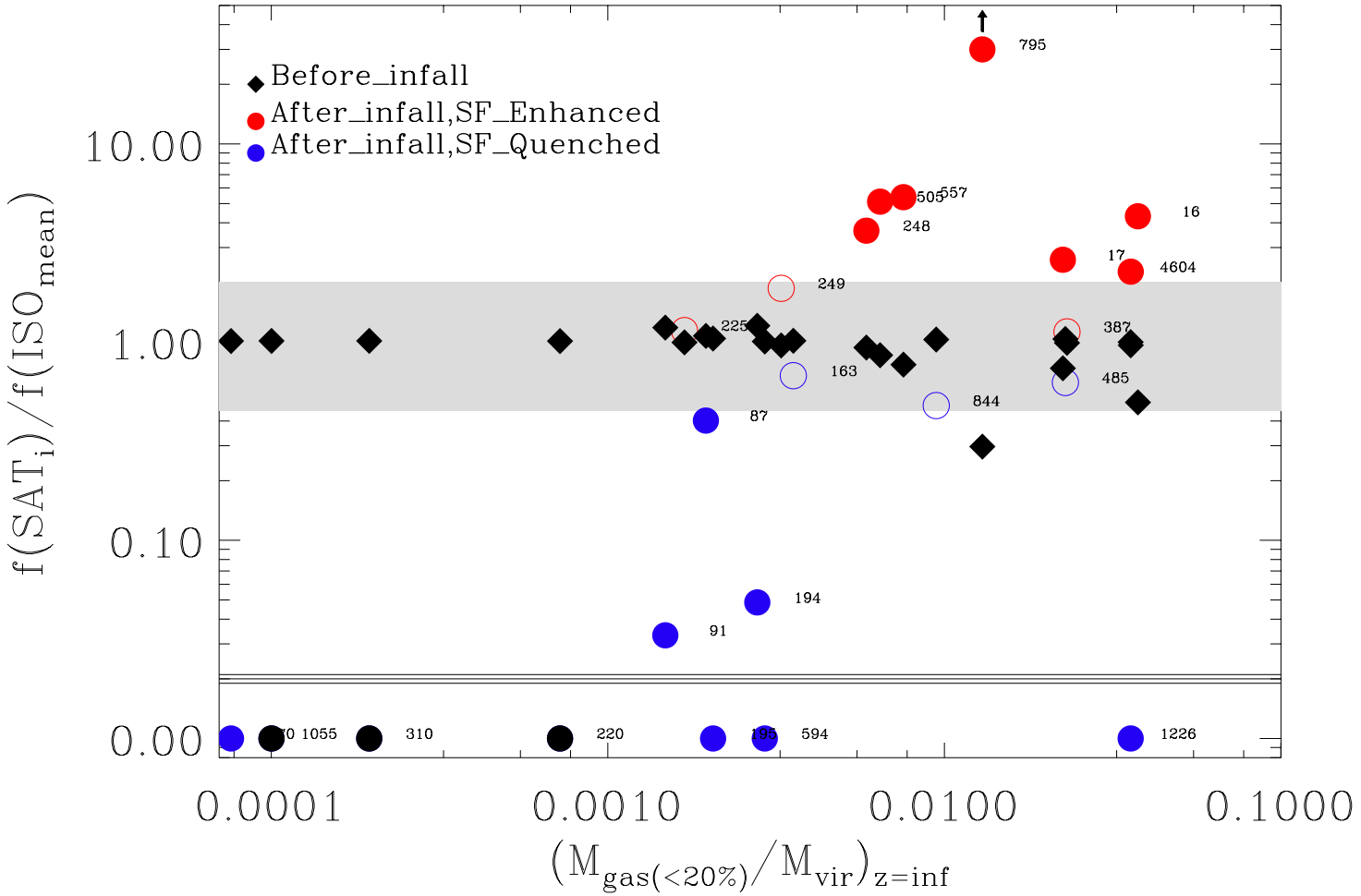
Enhanced vs quenched satellites



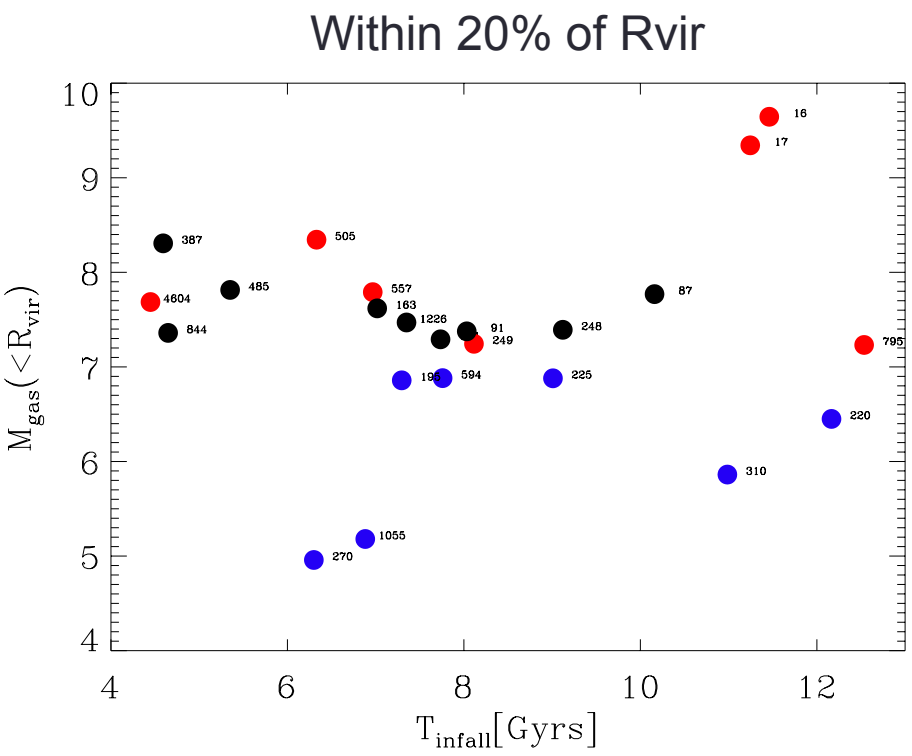


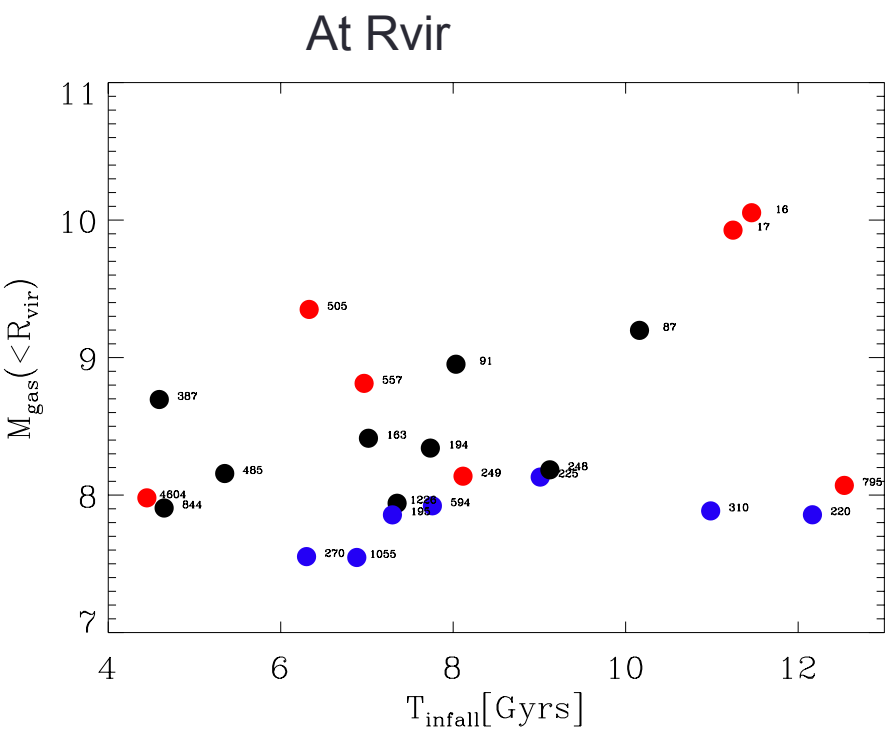


Enhanced satellites have high gas fraction

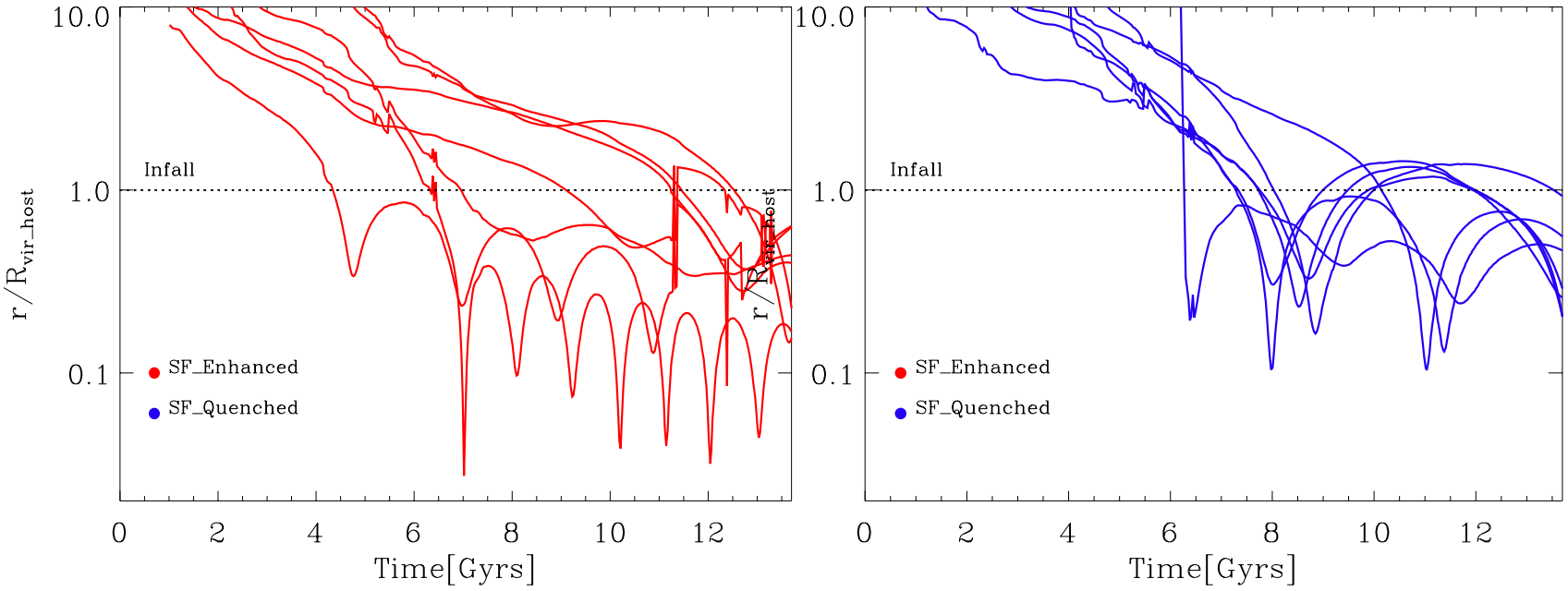


Similar M_{gas} out to R_{vir}, different in the inner region → hot vs cold, star forming gas

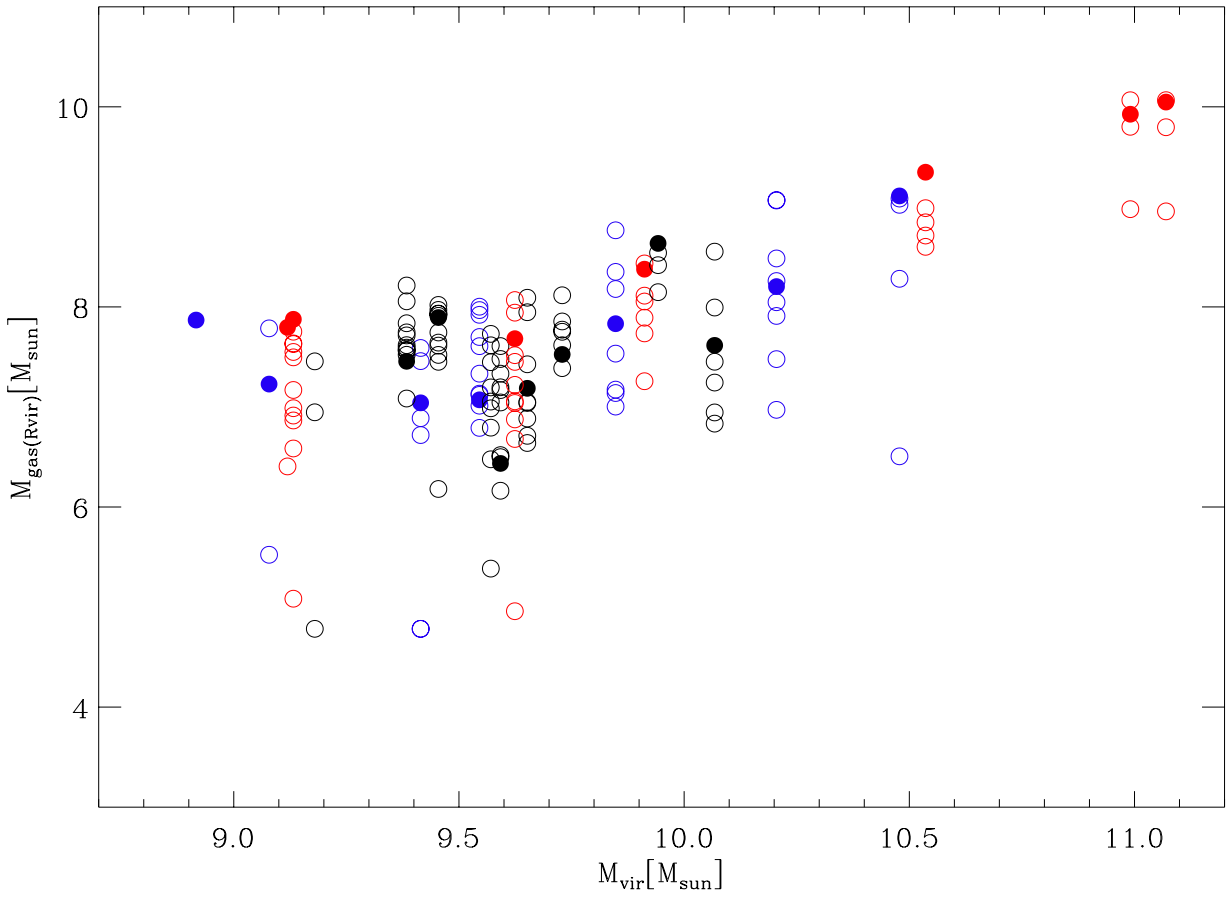


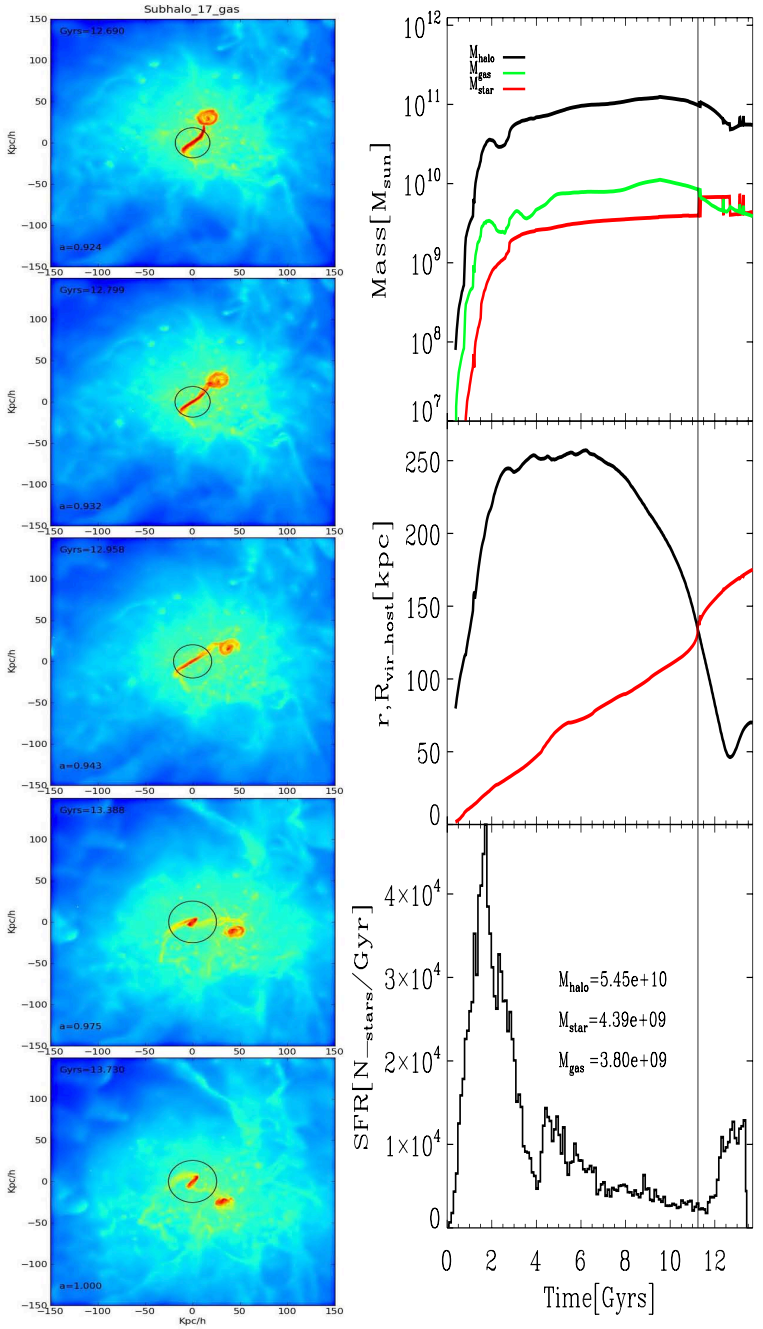


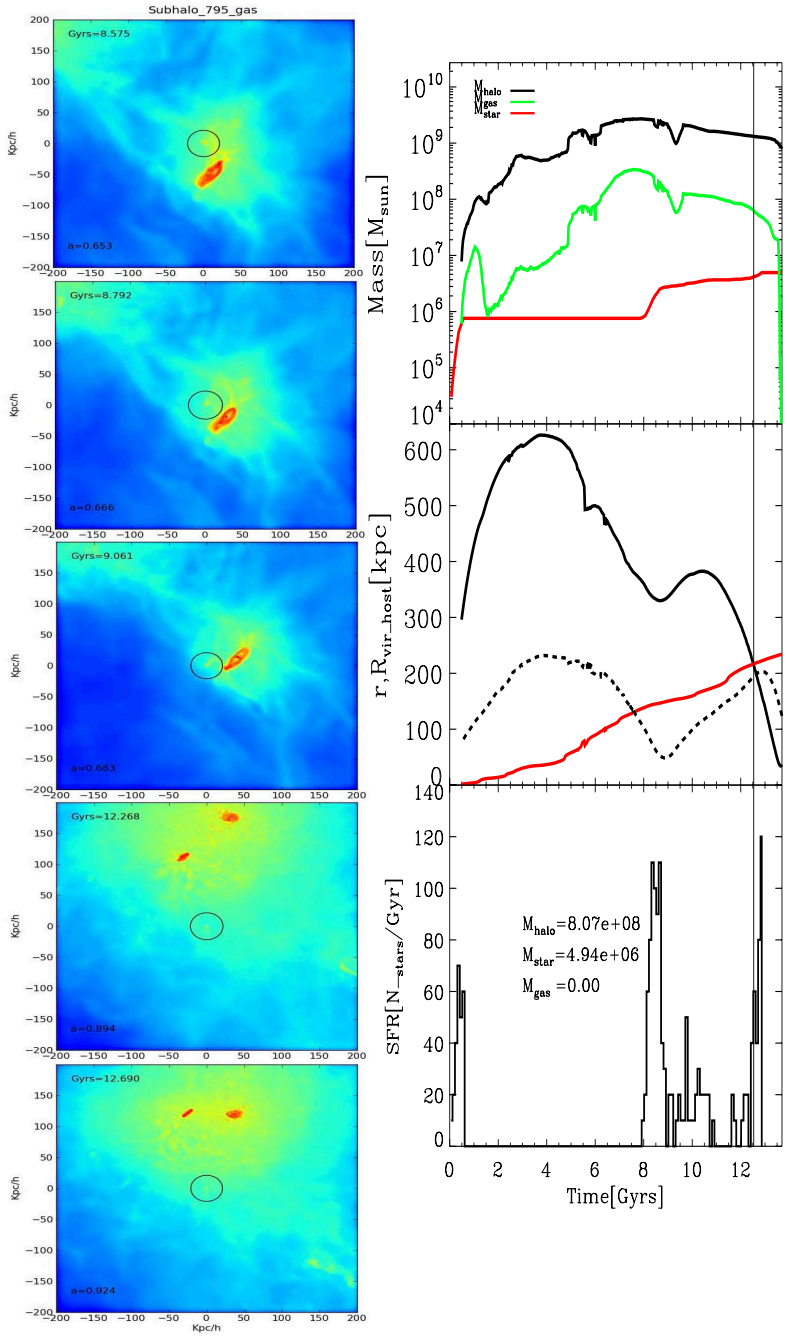
Orbits


10.0
1.0
0.1
Infall
SF_Enhanced
SF_Quenched
r / R_vir_host
0
2
4
6
8
10
12
Time[Gyrs]
10.0
1.0
0.1
Infall
SF_Enhanced
SF_Quenched
0
2
4
6
8
10
12
Time[Gyrs]

Gas mass vs Halo mass at infall




Subhalo_17_gas
Gyrs=12.690
a=0.924
Gyrs=12.799
a=0.932
Gyrs=12.958
a=0.943
Gyrs=13.388
a=0.975
Gyrs=13.730
a=1.000
Kpc/h
M_{halo}
M_{gas}
M_{star}
Mass[M_{sun}]
r, R_{vir_host}[kpc]
SFR[N_{stars}/Gyr]
M_{halo}=5.45e+10
M_{star}=4.39e+09
M_{gas} =3.80e+09
Time[Gyrs]


Subhalo_795_gas
Gyrs=8.575
a=0.653
Gyrs=8.792
a=0.666
Gyrs=9.061
a=0.683
Gyrs=12.268
a=0.894
Gyrs=12.690
a=0.924
Kpc/h
Mass[M_sun]
M_halo
M_gas
M_star
r, R_vir_host[kpc]
SFR[N_stars/Gyr]
M_halo=8.07e+08
M_star=4.94e+06
M_gas =0.00
Time[Gyrs]

Conclusion

- Pericentric passage can trigger a burst of SF as cold gas is compressed by tidal forces

- Necessary condition is to have a high fraction of cold, SF gas at infall