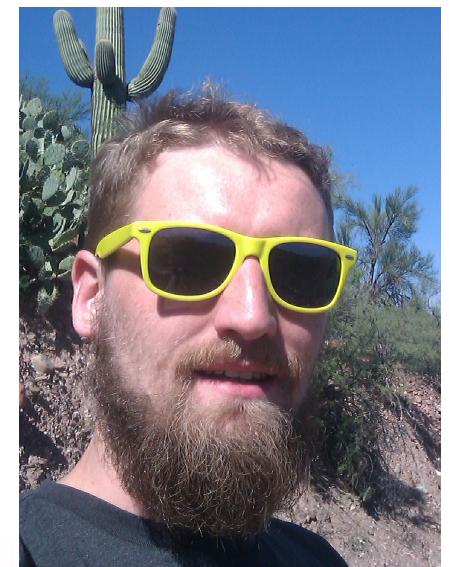


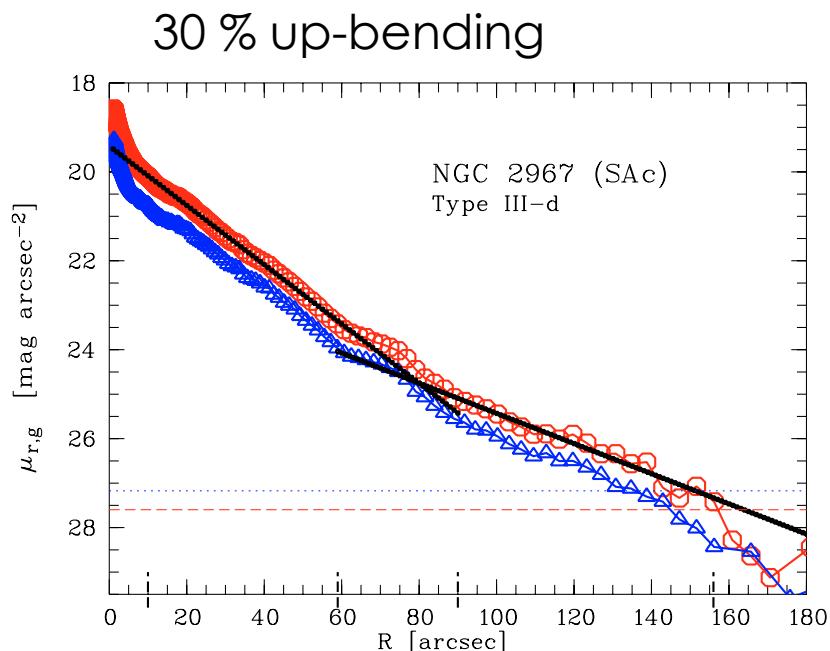
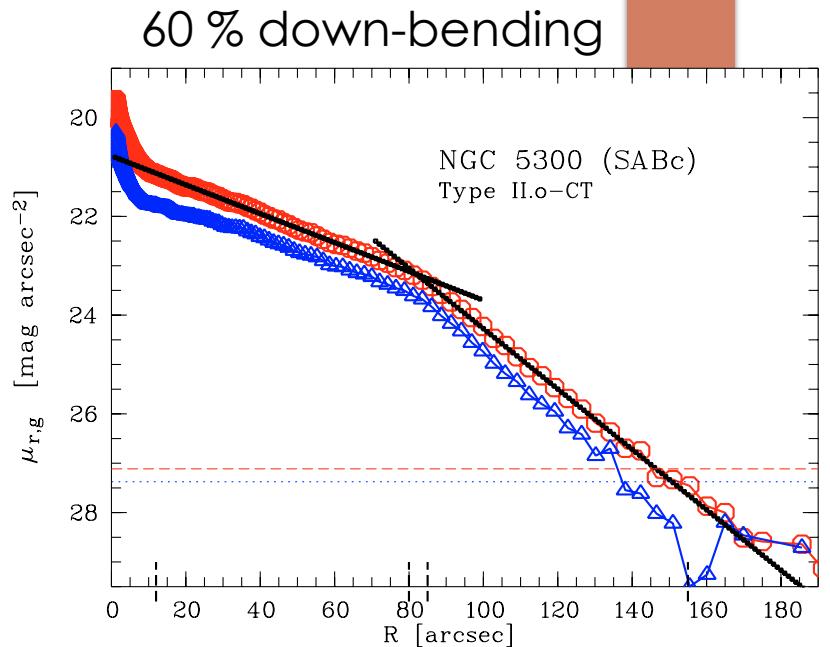
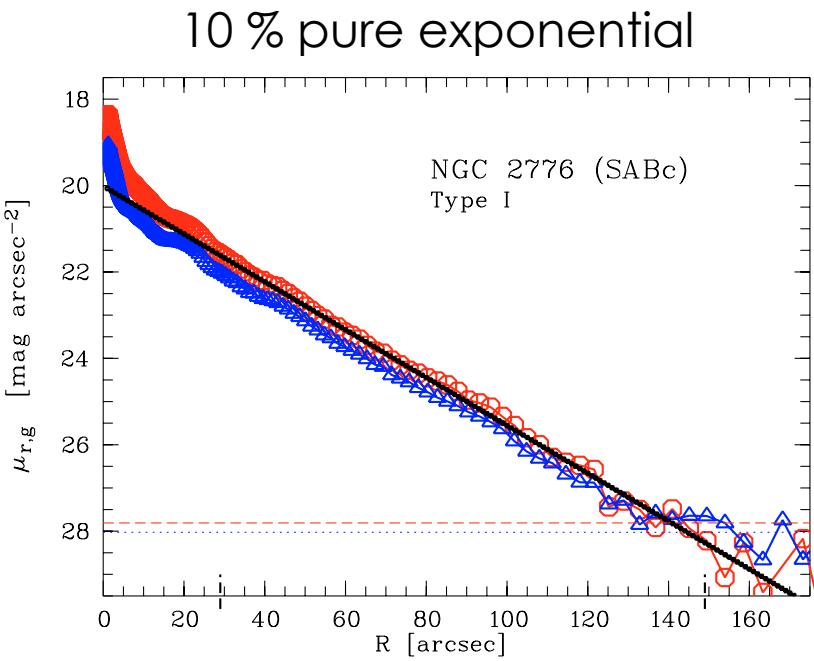
How to bend galaxy disc profiles: the role of halo spin

MARIE MARTIG
& JAKOB HERPICH (MPIA)

G. S. Stinson, A. A. Dutton, H.-W. Rix, R.
Roškar, A. V. Macciò, T. R. Quinn, J. Wadsley

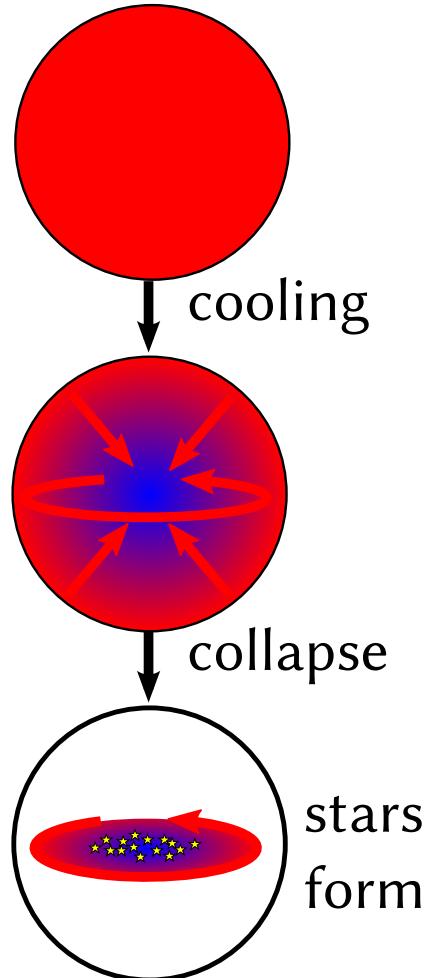


Observed disk profiles



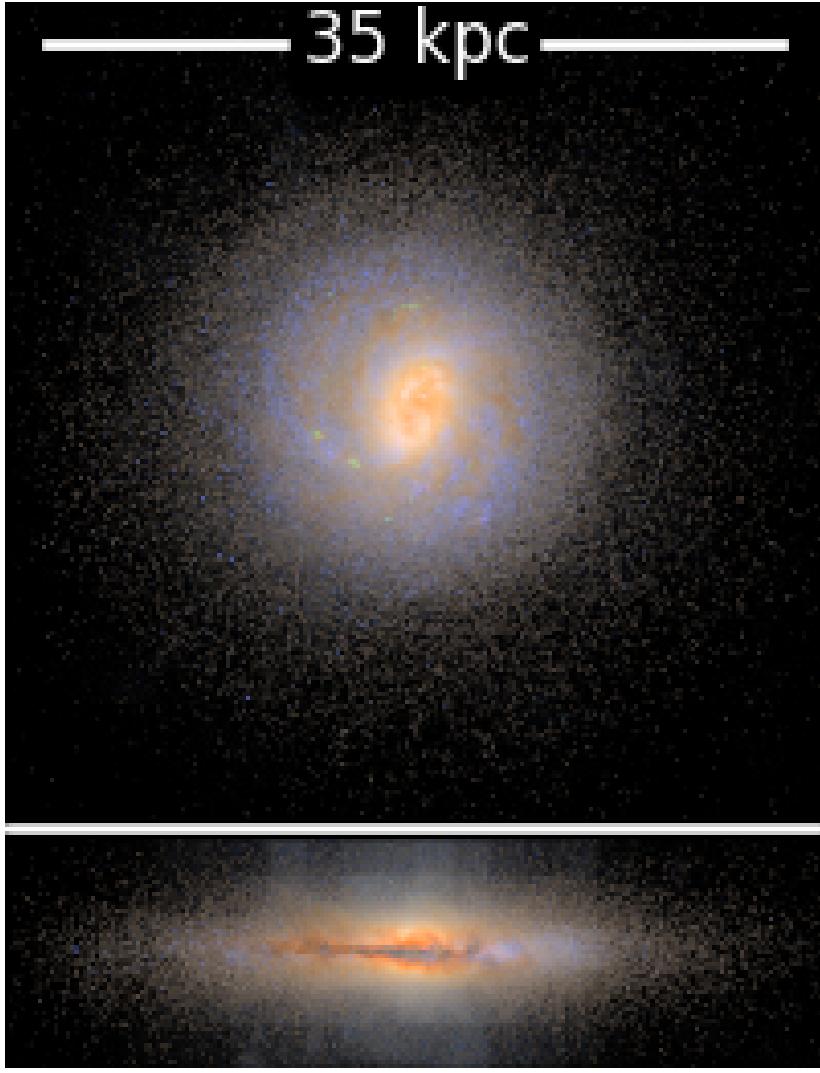
Pohlen & Trujillo 2006

Simulations set-up



- ▶ Gravity + SPH simulations
- ▶ Isolated halos, $M_{\text{vir}} = 10^{12} \text{ M}_{\odot}$
- ▶ Dark matter + spinning gas sphere in hydrostatic equilibrium
- ▶ Cosmologically motivated angular momentum distribution
- ▶ Halo spin parameter
$$0.02 < \lambda < 0.1$$
- ▶ Evolve for 8 Gyr

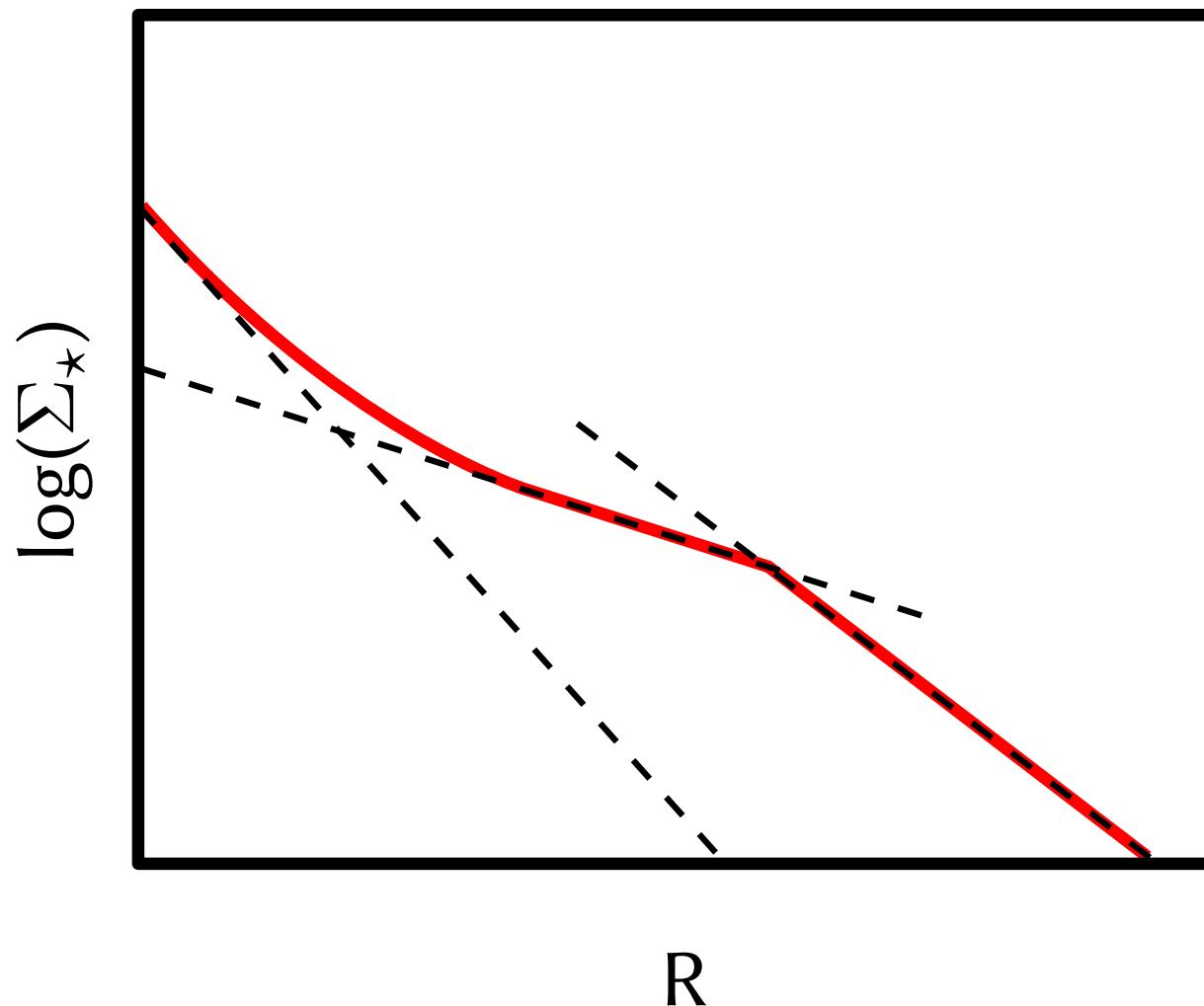
$\lambda = 0.03$



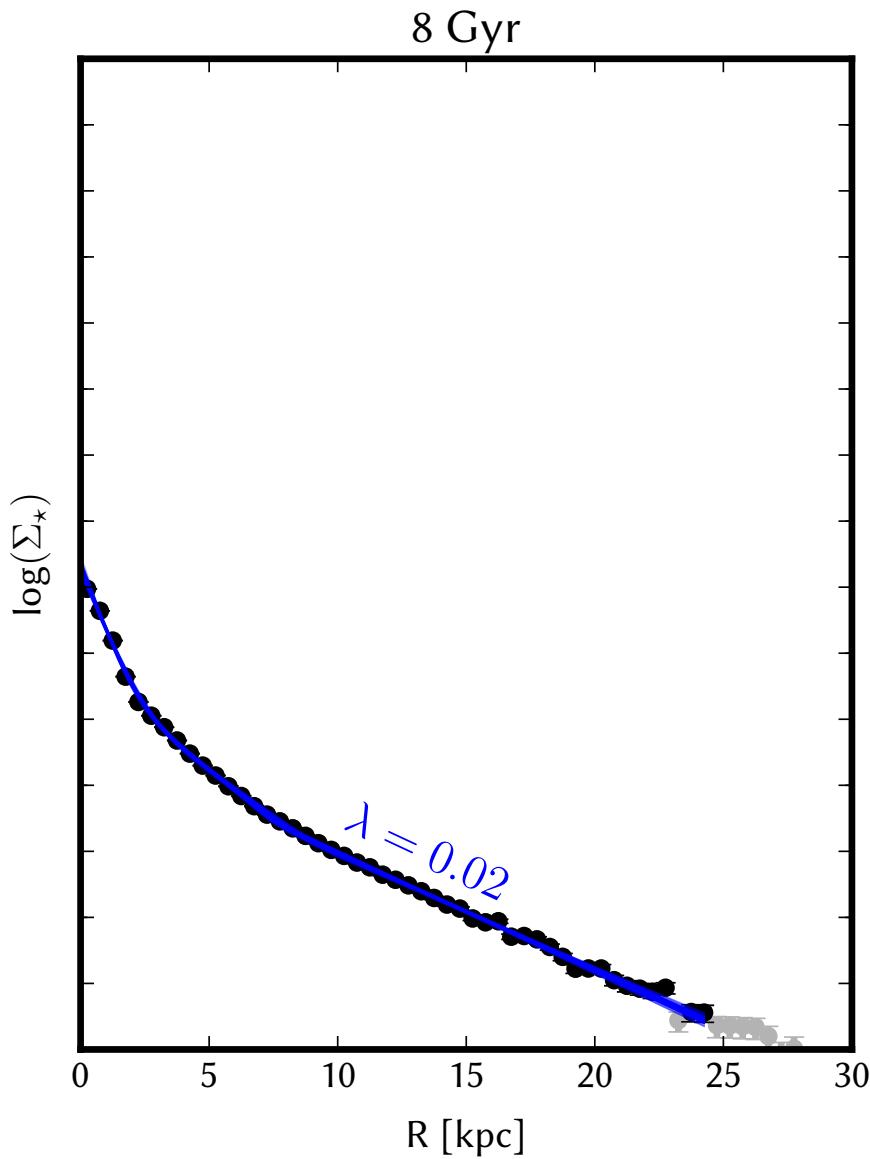
$\lambda = 0.06$



MCMC fit to broken disk density profile

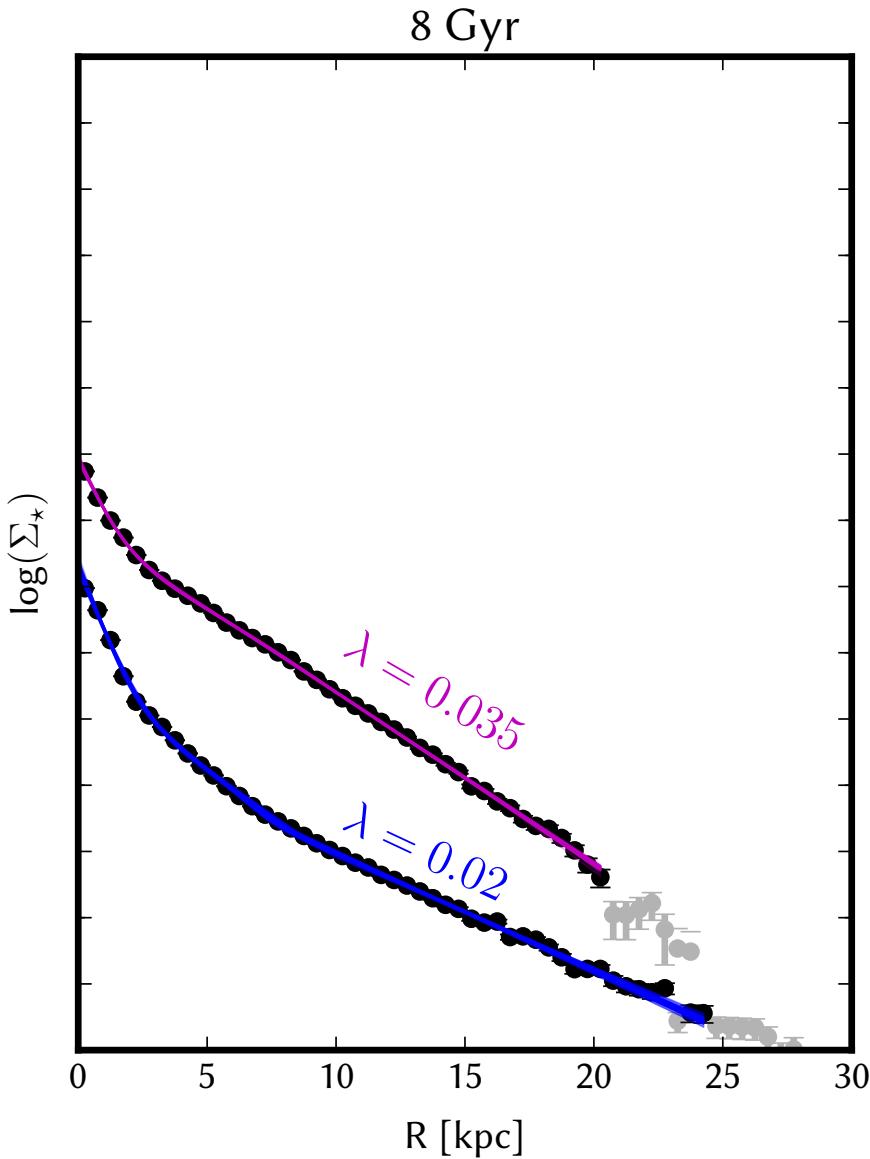


Spins and disk shapes



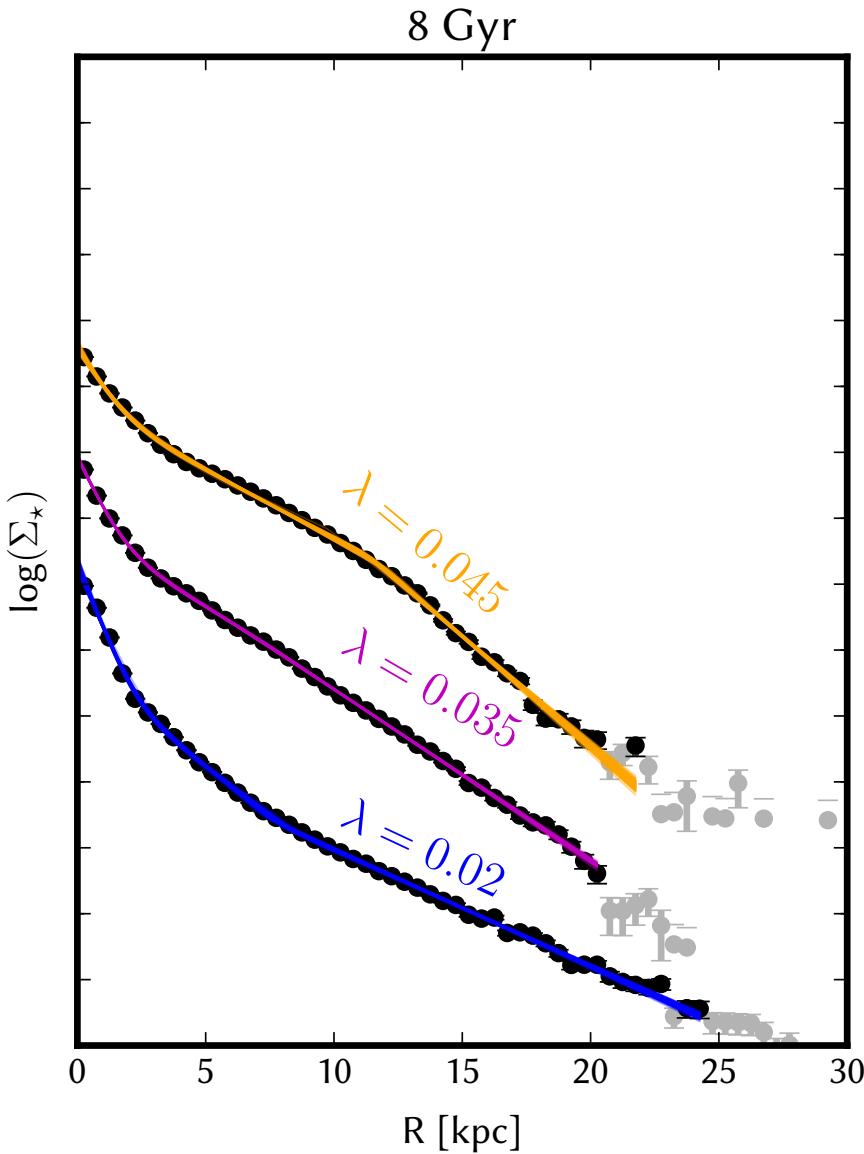
► low spin: up-bending

Spins and disk shapes



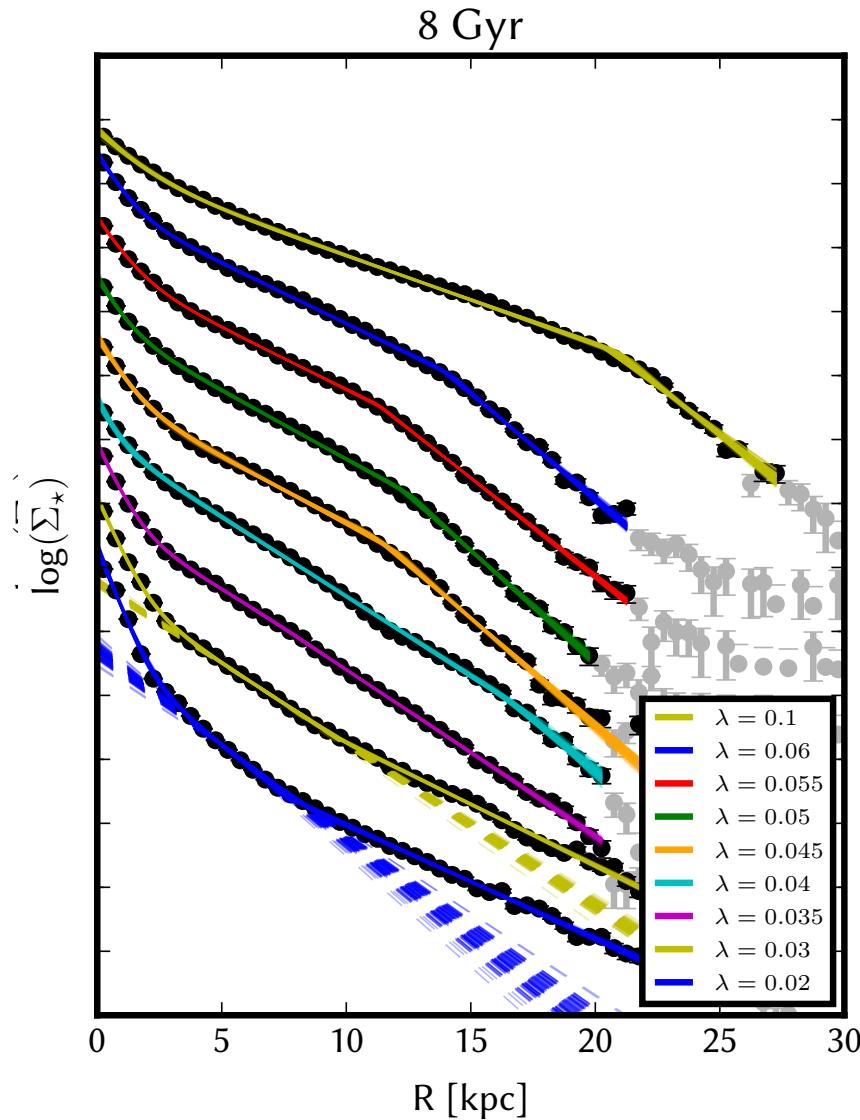
- ▶ low spin: up-bending
- ▶ intermediate spin: no break

Spins and disk shapes

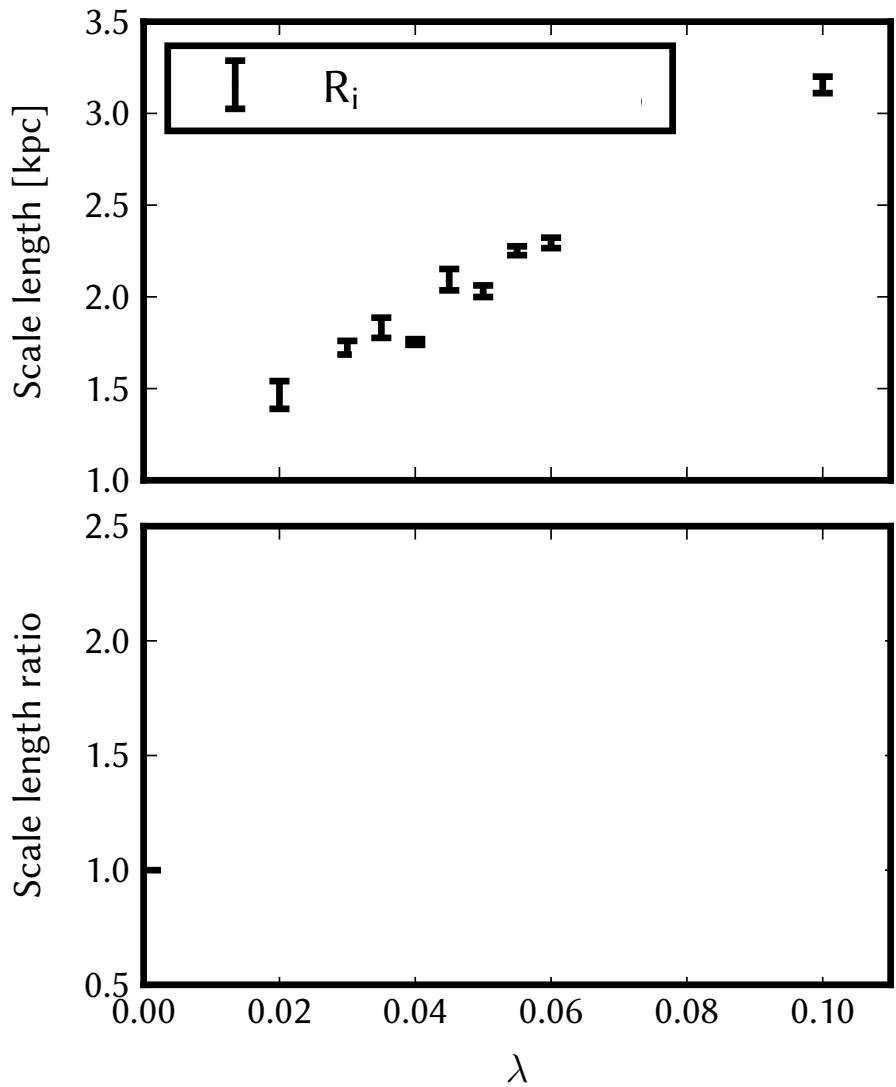
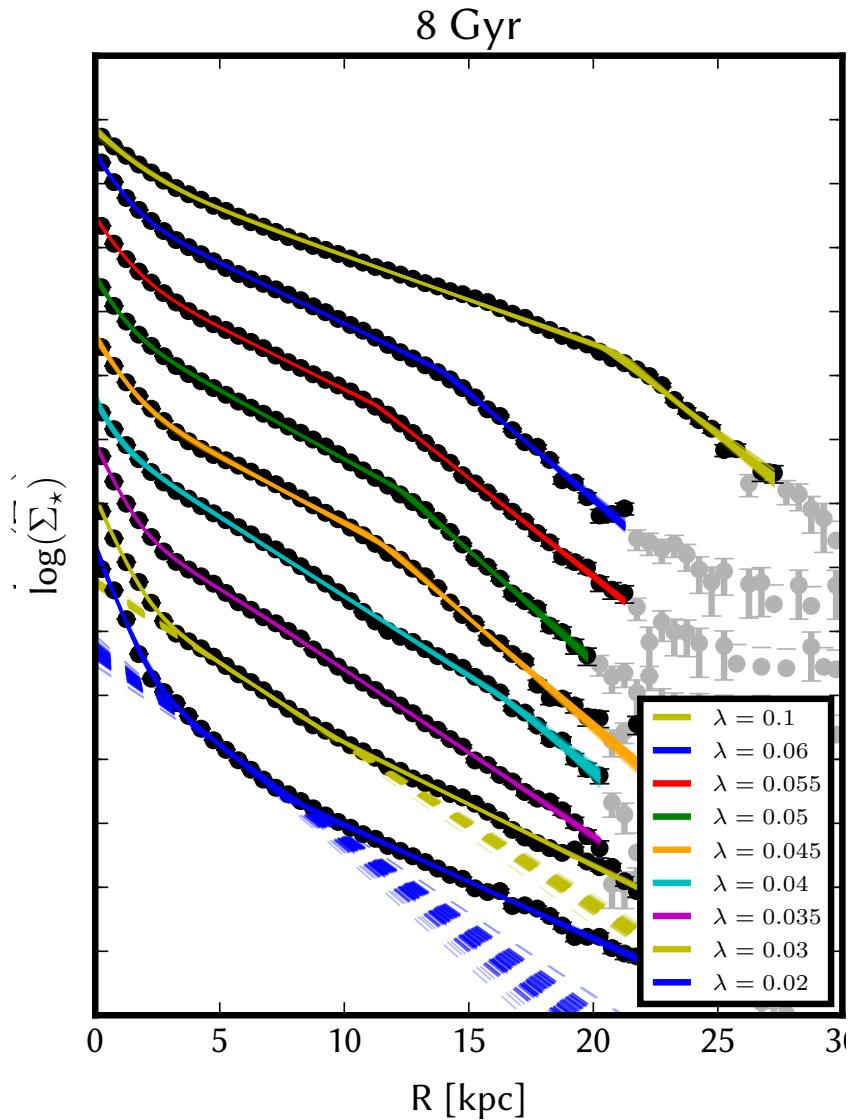


- ▶ low spin: up-bending
- ▶ intermediate spin: no break
- ▶ high spin: down-bending

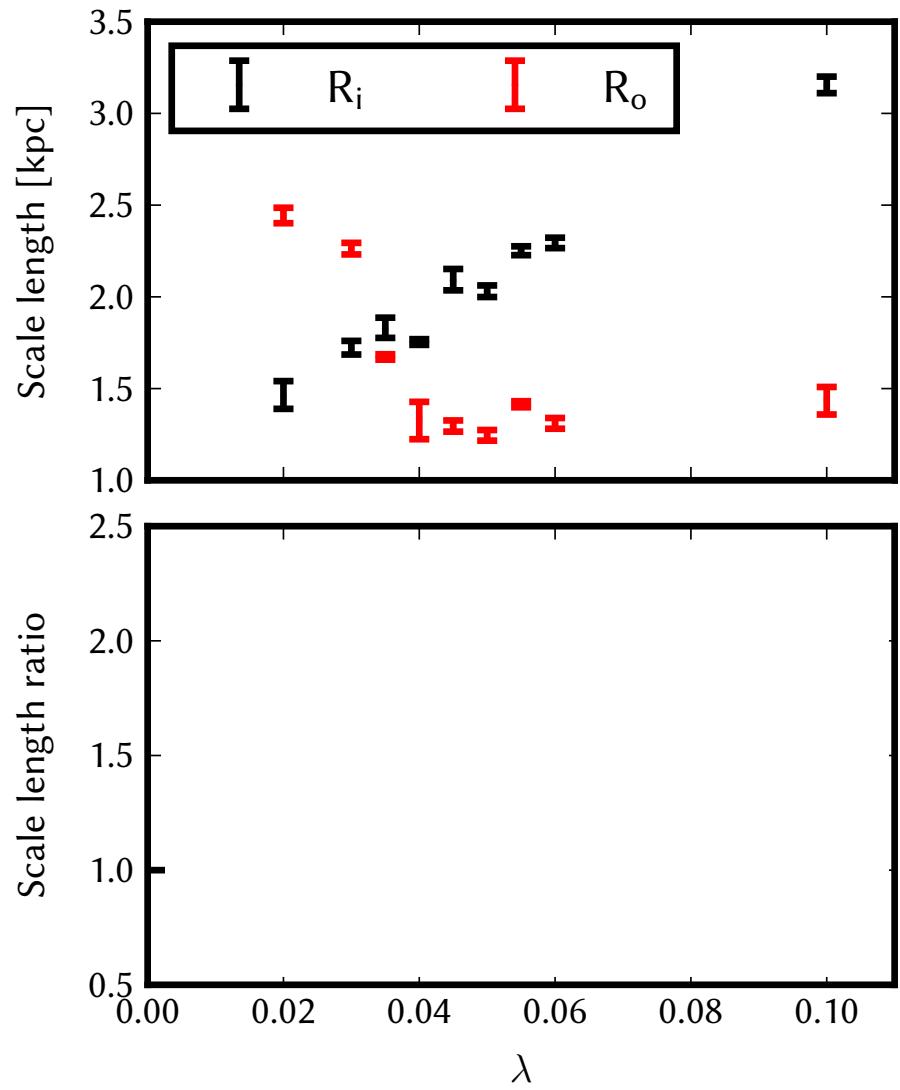
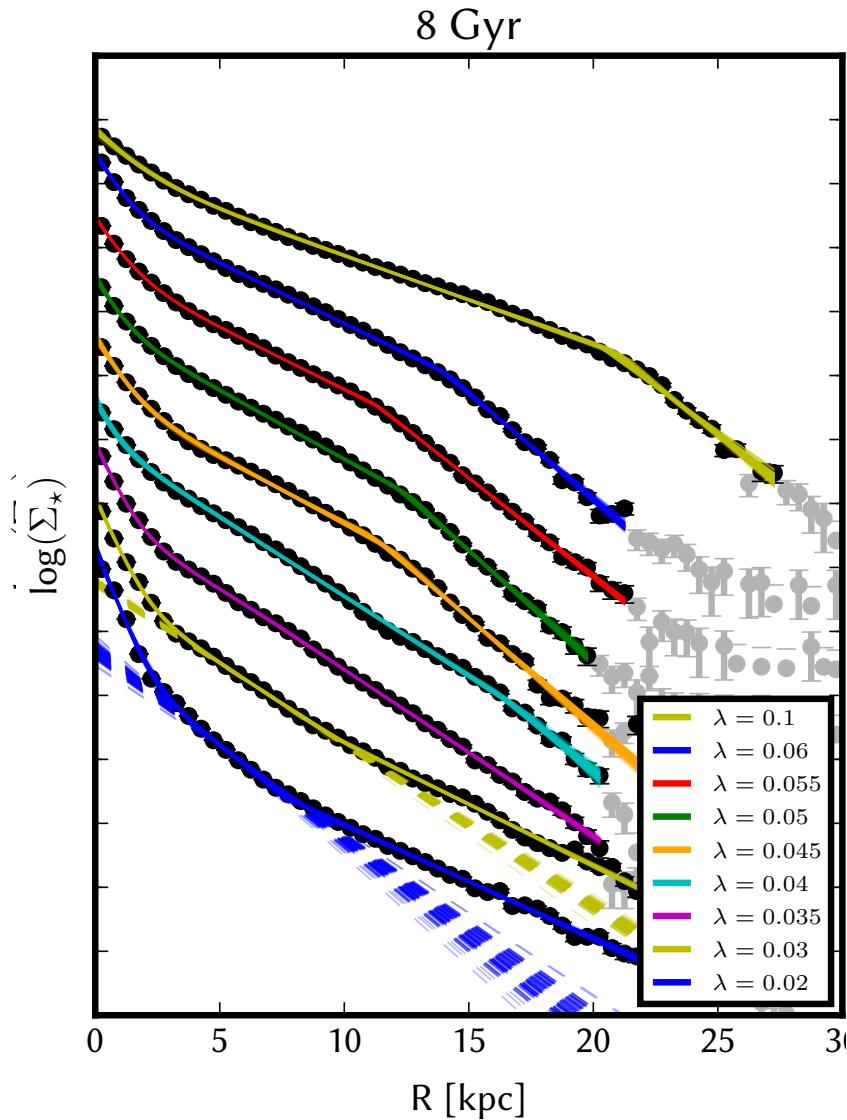
Spins and disk shapes



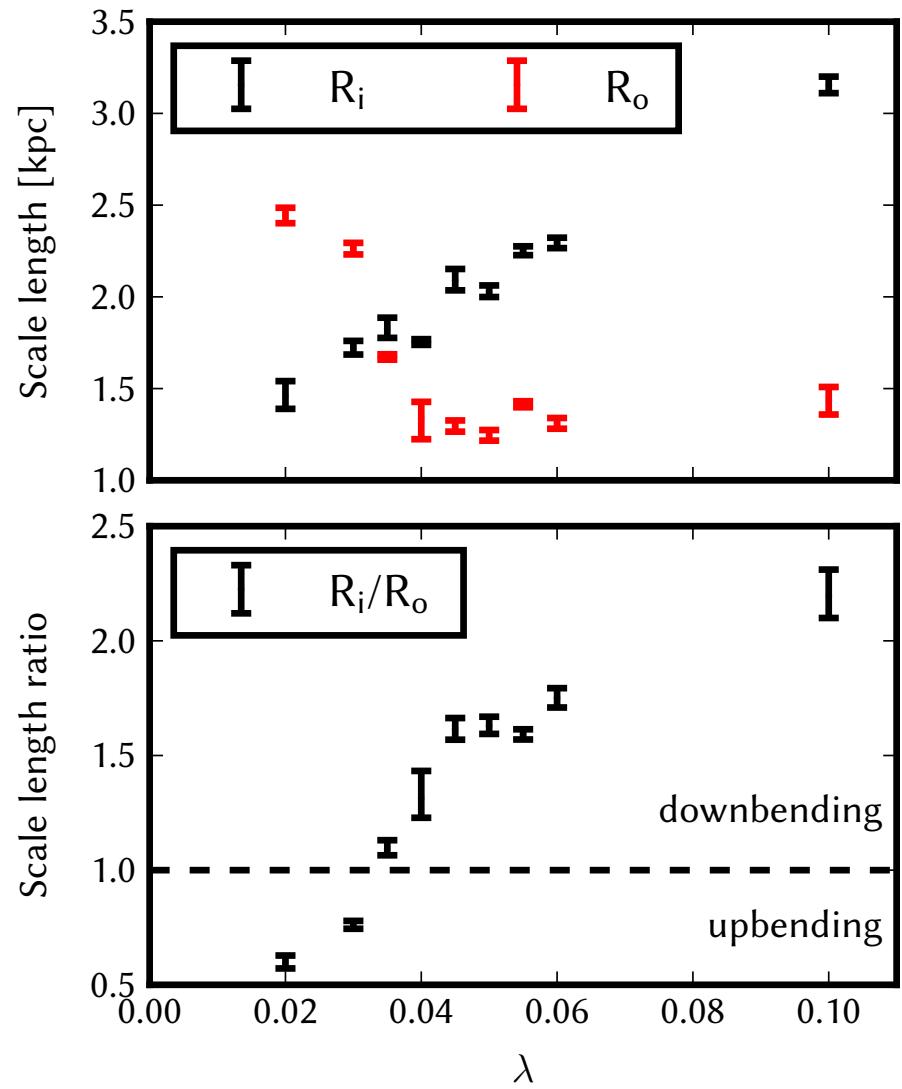
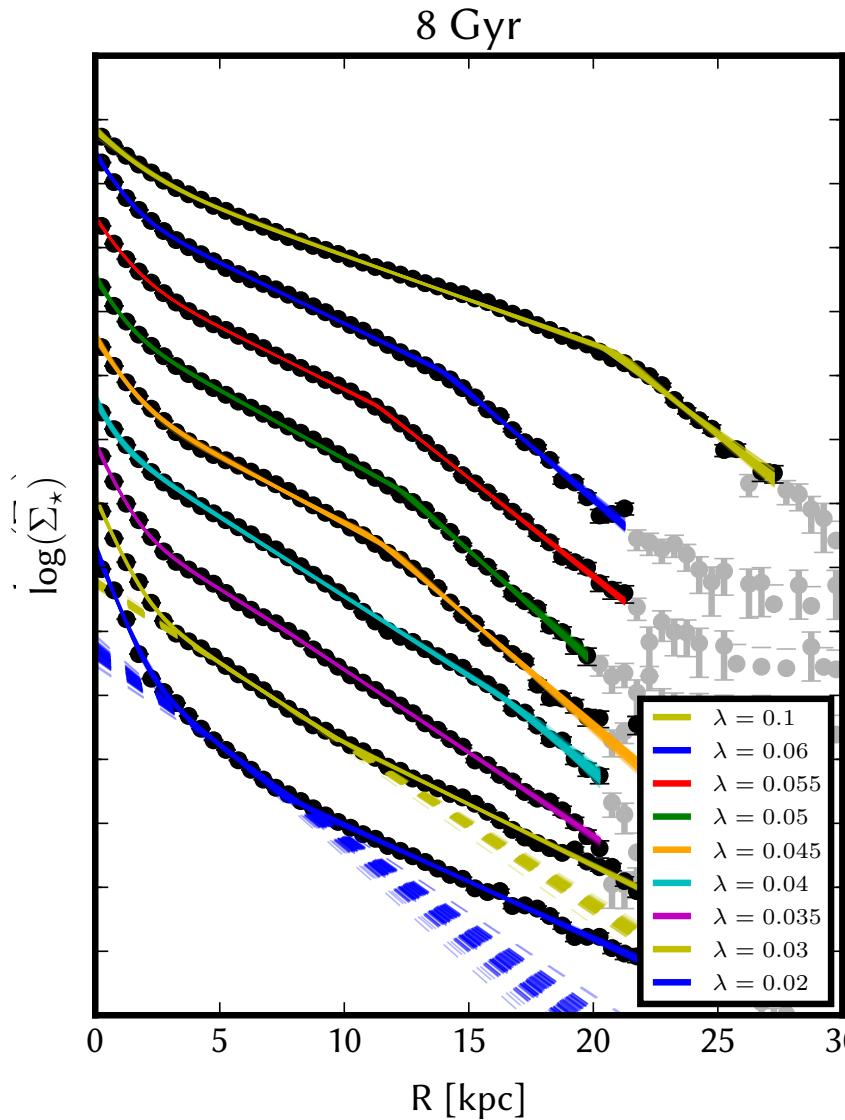
Spins and disk shapes



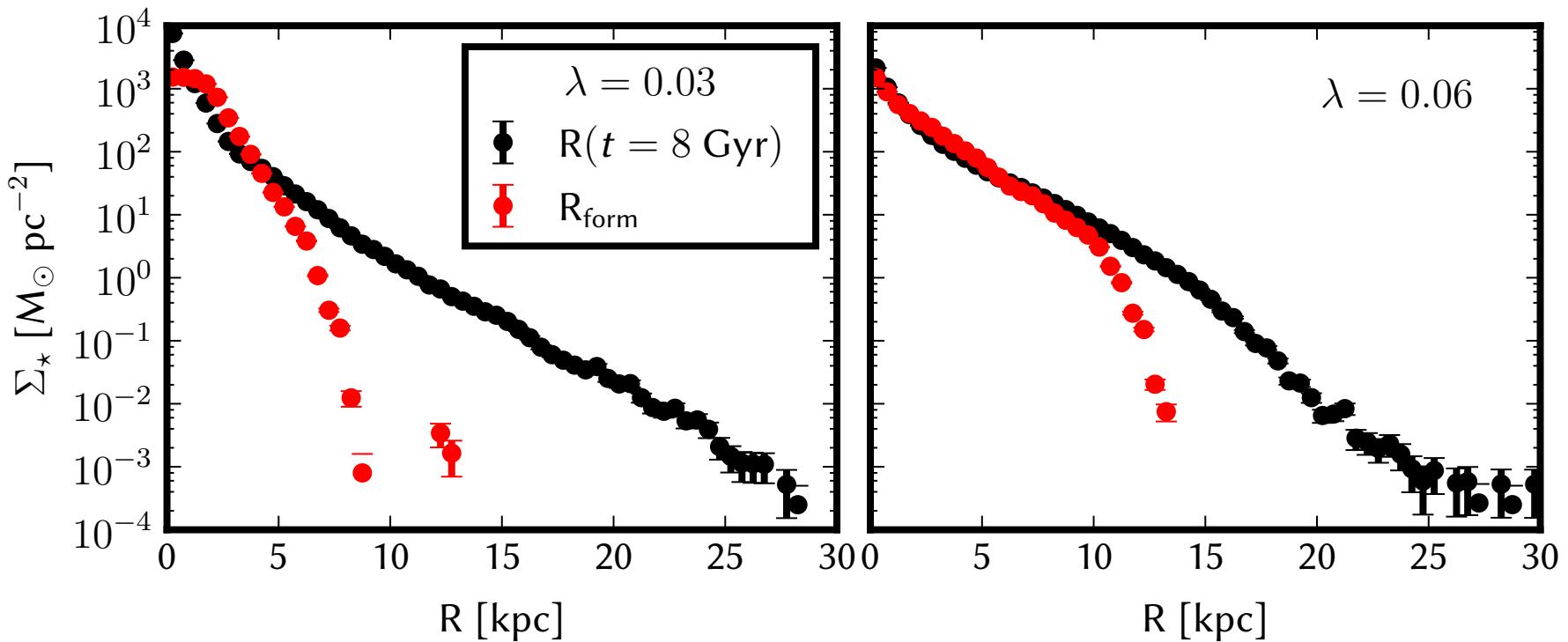
Spins and disk shapes



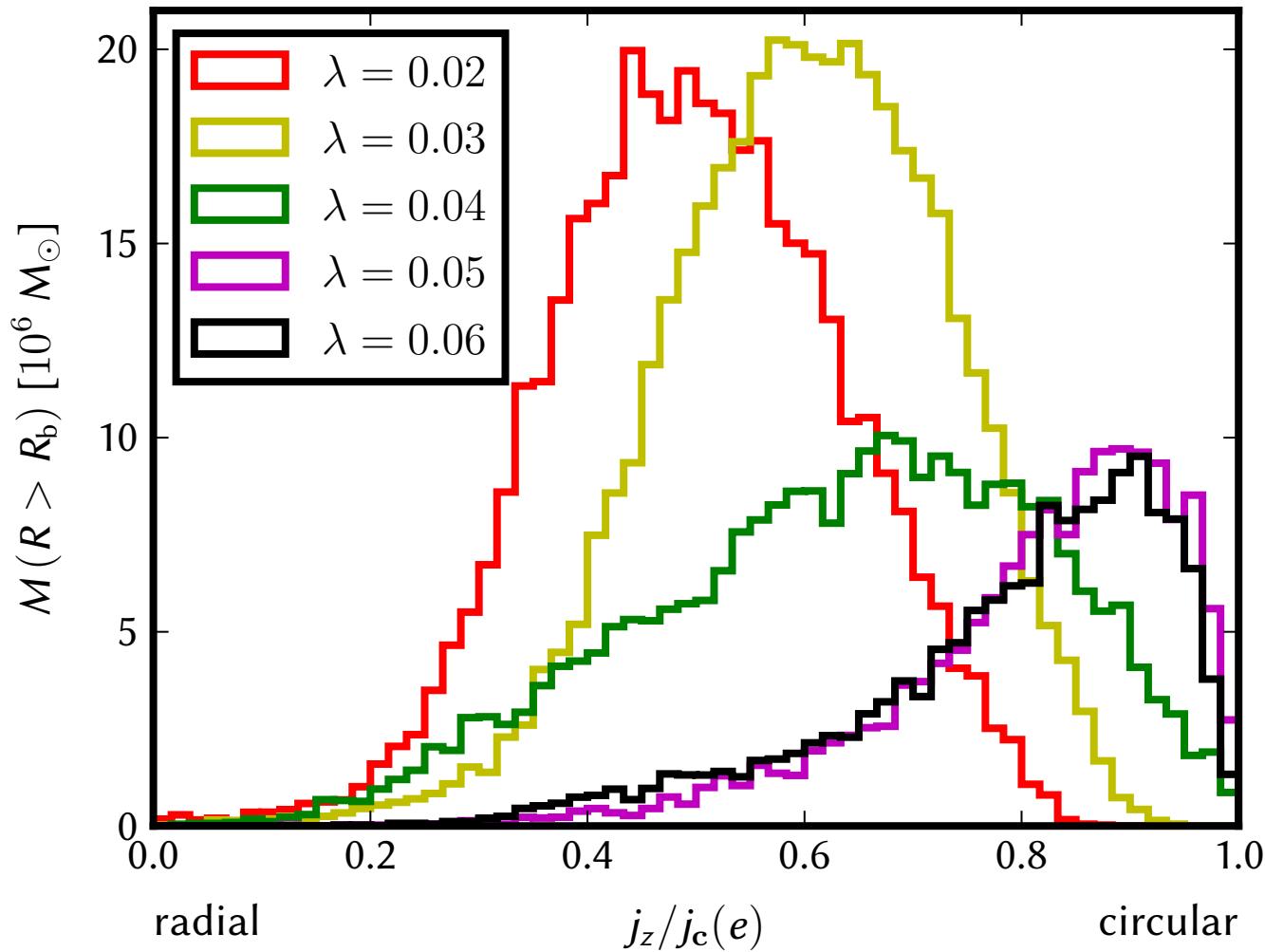
Spins and disk shapes



Origin of stars in disk outskirts



Orbits of stars beyond disk break



Conclusion

- ▶ Disk shape correlates with initial halo spin
- ▶ Low/high spin: up-/down-bending disks
- ▶ Down-bending breaks: radial migration, circular orbits
- ▶ Up-bending breaks: only eccentric orbits – unusual kinematics

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