Radial Migration Versus Gas-rich Merger on the Formation of Galactic Disks

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Prediction of Migration Models

Schonrich & Binney (2009)
$R_{\text{mean}}$, $V_\phi$, and $e$ in [Fe/H] and [$\alpha$/Fe] Plane
Rotation Velocity Gradients

- $N_{\text{thin}} = 9834$, $\Delta V_{\phi}/\Delta [\text{Fe/H}] = -21.7 \pm 1.5$
- $N_{\text{thick}} = 6031$, $\Delta V_{\phi}/\Delta [\text{Fe/H}] = +48.9 \pm 3.0$

$V_{\phi}$ [km s$^{-1}$]

$\sigma_{V\phi}$ [km s$^{-1}$]

[Fe/H]
Predictions of Gas-rich merger

Brook et al. (2007)
Rotational Velocity Gradient over $R$

- $N_{\text{thin}} = 9814$, $\Delta V_{\phi}/\Delta R = +0.3 \pm 0.5$
- $N_{\text{thick}} = 5983$, $\Delta V_{\phi}/\Delta R = -4.9 \pm 1.3$

- $N_{\text{thin}} = 9814$, $\Delta \sigma_{V_{\phi}}/\Delta R = -0.8 \pm 0.7$
- $N_{\text{thick}} = 5983$, $\Delta \sigma_{V_{\phi}}/\Delta R = -1.1 \pm 0.9$

$V_{\phi}$ [km s$^{-1}$] vs. $R$ [kpc]

$\sigma_{V_{\phi}}$ [km s$^{-1}$] vs. $R$ [kpc]
Distribution of Eccentricity

Sales et al. (2009)