$f_\lambda = f_{\text{gas}}/\lambda$

(Q2)

Slow assembly;
High gas fraction

Clumpy disk

(Q1)

Fast assembly;
High gas fraction

Hot bulge

$\gamma = \dfrac{\dot{V}_v}{V_v H(z)}$

(Q3)

Slow assembly;
Low gas fraction

Cold disk

(Q4)

Fast assembly;
Low gas fraction

Hot disk