

# Preheating (linear theory)

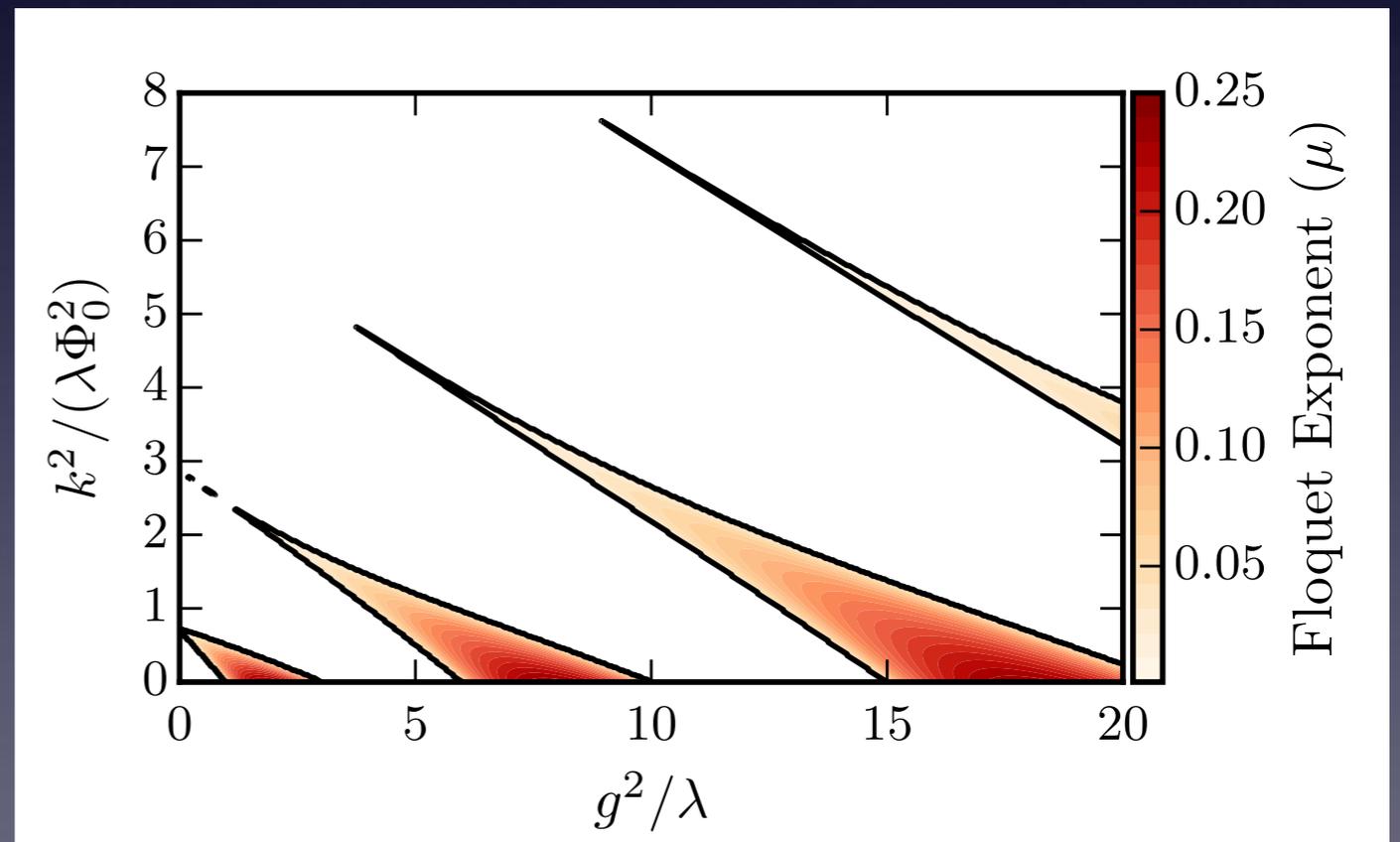
[e.g. Traschen, Bradendberger /  
Kofman, Linde, Starobinski]

$$\phi = \bar{\phi}(t) + \delta\phi$$

$$V(\phi) = \frac{\lambda}{4}\phi^4$$

$$\delta\ddot{\phi} + (k^2 + V''(\bar{\phi}))\delta\phi = 0$$

In linear theory,  $\bar{\phi}$   
acts as an external driver  
for the fluctuations



Full treatment includes backreaction and rescattering

Volume  
Var: lnrho  
- 3.000  
- 1.500  
0.000  
- 1.500  
- 3.000  
Max: 2.783  
Min: -4.958

