The Perturbation Theory in f(R) Gravity - Phantom Oscillation -

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Perturbation around the future de Sitter state

- de Sitter condition $R = R_1 = \text{const.}$

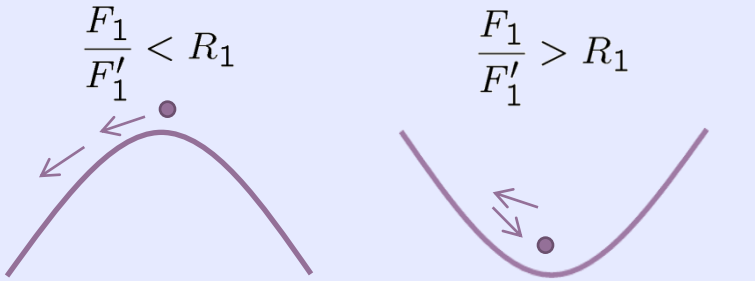
$$R_1 F_1 = 2 f_1$$

$$f_1 = f(R_1)$$
$$F_1 = f'(R_1)$$

First order perturbation with respect to $\delta R = R - R_1$

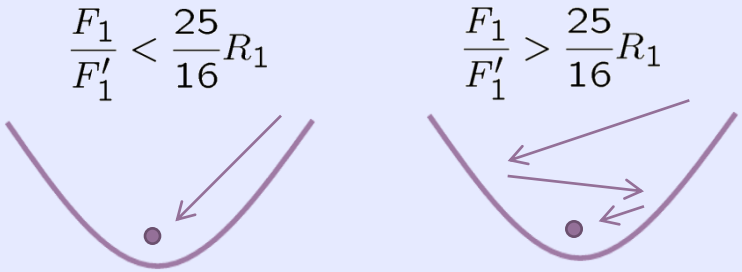
- Stability condition

$$\frac{F_1}{F_1'} > R_1$$



- Oscillation condition

$$\frac{F_1}{F_1'} > \frac{25}{16} R_1$$



Phantom Oscillation