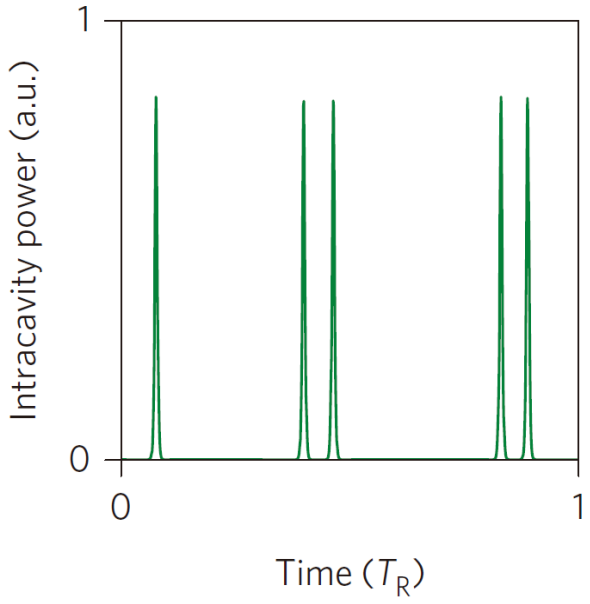
Q1

Compare the velocity and the mean radius of each solitons of the multiple soliton state.

The angular velocity of solitons only depends on the free spectral range of the cavity (independent of the pump laser frequency).

$$\dot{\theta} = 2\pi \times \mathrm{FSR}$$

If multiple solitons exist, they have the same profile with a constant distance between them.



Intracavity power for five solitons

Q2

Phase locking is a necessary process for the conventional frequency combs. How can it be done for microcavity-based frequency combs?

The offset frequency give rise to a phase slip which is a serious trouble to the frequency comb. To overcome this problem, the cavity is usually stabilized by comparing to the doubled its own frequency.

The carrier envelope frequency of the microcavity-based frequency comb is accessible by varying the pump laser frequency with respect to the cavity mode. Above conventional self-referencing method can be applied to the microcavity combs. However, the comb in this work is operated in a free-running mode, that is without active control of line spacing or offset frequency