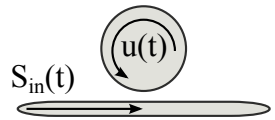
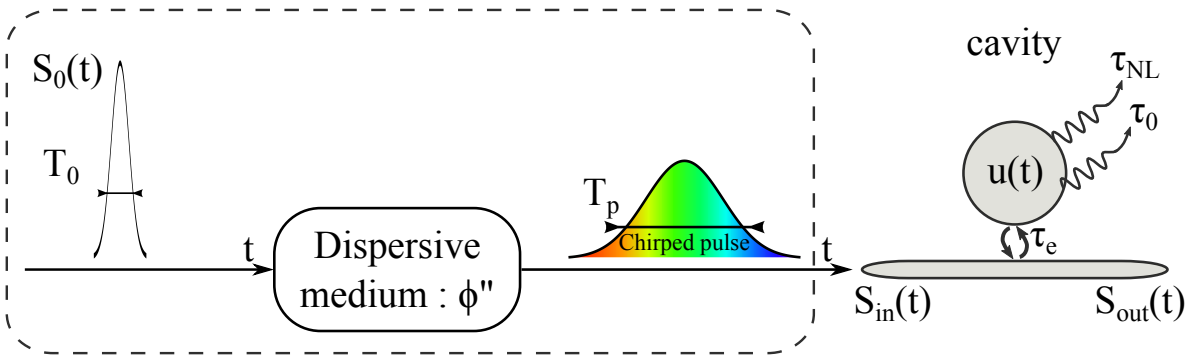
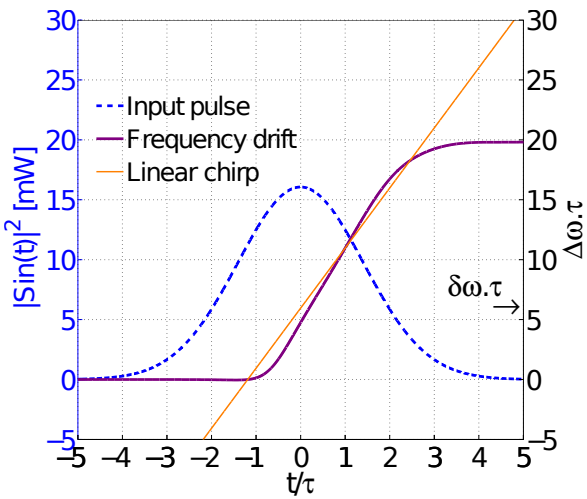
Nonlinear microcavity under coherent control

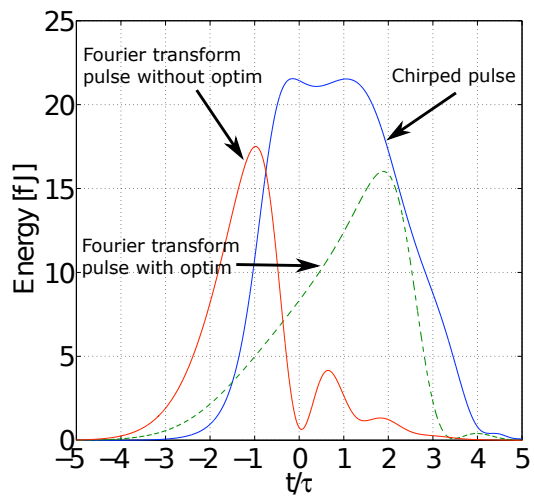
Jérémy Oden, Stéphane Trebaol, Nicolas Dubreuil

$$\frac{\mathrm{d}|u|^2}{\mathrm{d}t} + \frac{2}{\tau}|u(t)|^2 = 2\sqrt{\frac{2}{\tau_e}}\,|u(t)|.|s_{\mathrm{in}}(t)|.\cos[\phi_u(t) - \phi_{in}(t)]$$









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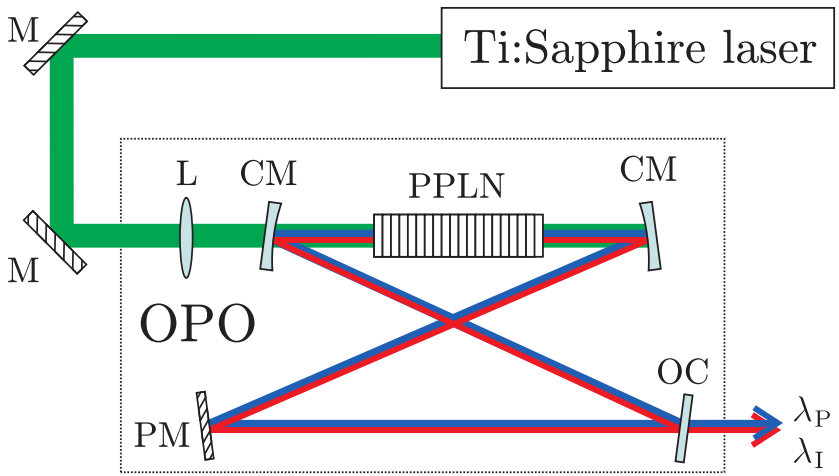
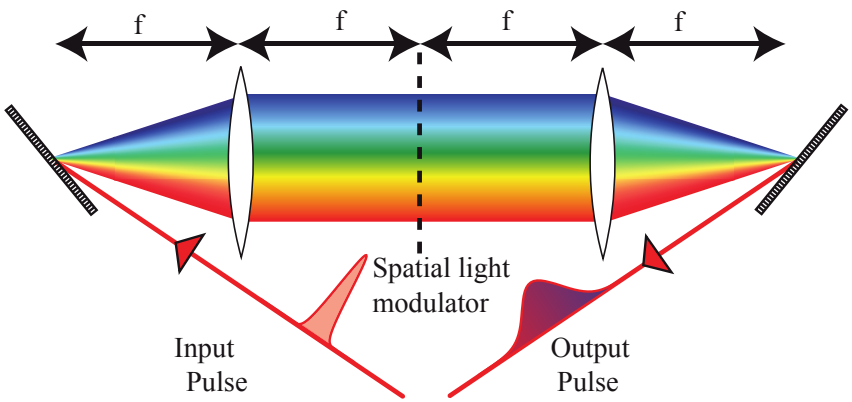


Ryasnyanskiy *et. al.*, JEOS Rap. Public. 08037 **3**, 2008.



Weber, Université Toulouse III – Paul Sabatier, PhD Thesis, 2010.

Results

- Coherent control ⇒ better coupling efficiency
- Enhanced nonlinearities

Experimental setup

- Pump-probe experiment
- Phase shaper

Potential applications

- Low power optical switch
- Applications to coupled cavities
- Controlling the dynamics