Addendum: "Ultimate fast optical switching of a planar microcavity in the telecom wavelength range" [Appl. Phys. Lett. 98, 161114 (2011)]

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We have recently reported on the ultimate fast optical switching of semiconductor micro cavities by means of the electronic Kerr effect.[1] We demonstrated that the switching of the cavity resonance takes place within $\tau_{cav} = 0.3$ ps and that the switching time is only limited by the quality factor Q of the cavity.

It was brought to our attention that we had not specified the pump and probe intensities used in our experiments. Since these parameters are crucial for the understanding of the underlying non-linear optical processes, we report them here. First of all, we used a low probe beam intensity to avoid non-linear effects caused by the probe beam during the measurements. We, therefore, set the probe beam intensity to $I_{pr} = 0.18\,\text{pJ}/(\mu\text{m})^2$ at $\lambda = 1300$ nm, which relates to an intracavity intensity of $I_{pr,cav} = 9\,\text{pJ}/(\mu\text{m})^2$, due to the enhancement caused by the cavity resonance.[2]

The pump beam intensity is one order of magnitude stronger. Its precise value results from a trade-off between the optimization of the electronic Kerr effect and the minimization of free-carrier excitation. We, therefore, chose the pump intensity to a value, which can also be employed in cavities with dimensions of a few microns, namely, an intensity of $I_{pu} = 70\,\text{pJ}/(\mu\text{m})^2$ at $\lambda = 2400$ nm. A detailed study of the intensities will be performed in the future.

[1]G. Ctistis, E. Yüce, A. Hartsuiker, J. Claudon, M. Bazin, J.-M. Gérard, and W. L. Vos, Appl. Phys. Lett. **98**, 161114 (2011).
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