

## Band edge Fabry Perot resonators on SOI

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We will present results on slow wave Fabry Perot resonators on SOI waveguide. The cavity of interest consists in a 1D array of slits etched in a rib waveguide. We use the first band edge of this photonic crystal to slow down the speed of light and thus to increase the quality factor of the cavity. We will first present the results of 2D modelling (FDTD and plane waves) to explore the basic issues of this approach. In a second step, we will present 3D FDTD simulations on nanostructured rib waveguides. In this case, we will present and discuss the evolution of the quality factor of the cavity versus the etching depth, the length of the photonic crystal, and we will show how the structure could be adapted to reduce the coupling losses from an unetched rib waveguide. Experimental measurements will be compared to these simulations.

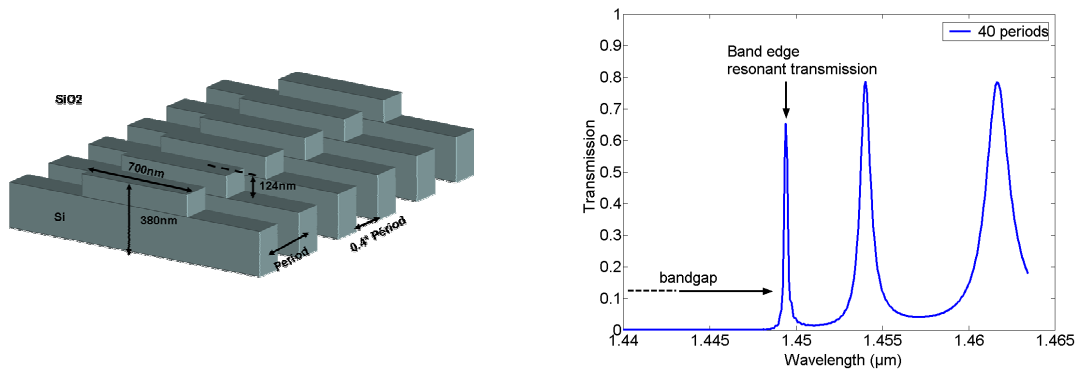


Figure 1 : Description of the photonic crystal cavity studied (left). Transmission spectra for a 40 periods optimized cavity (right).