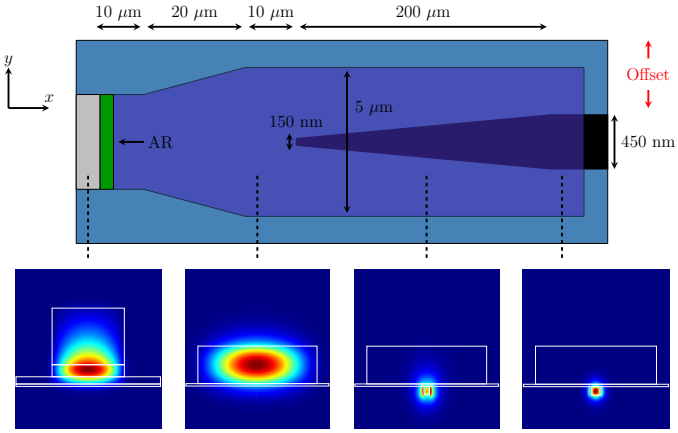

Fig. 13. Overall coupling structure. Light propagation from the III-V waveguide to the SOI waveguide in the overall coupling structure. Mode profiles along the coupler are indicated as well.

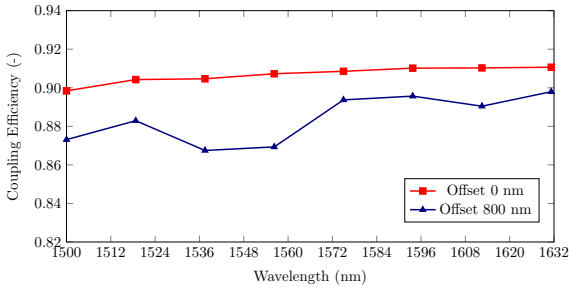

Fig. 14. Wavelength dependence of the coupler efficiency for the overall optimised coupling structure with polymer intermediate waveguide.

4. Conclusion

In this paper two novel tapered couplers for adiabatic mode conversion in active III-V/SOI devices have been presented. The first coupler makes use of a broad and thick *n*-InP waveguide to which light is coupled as an intermediate step. This greatly enhances the misalignment tolerance, which is needed to comply with the current requirements for high-throughput transfer printing. The second coupler makes use of a polymer as intermediate waveguide such that less III-V processing is needed to fabricate the structure. Supported by optical simulations the coupling structures have been shown to exhibit efficient and very alignment tolerant coupling over a broad wavelength range covering the C and L band. The proposed couplers are expected to facilitate transfer-printing based heterogeneous integration of processed active III-V membrane devices on both passive and active SOI platforms.

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