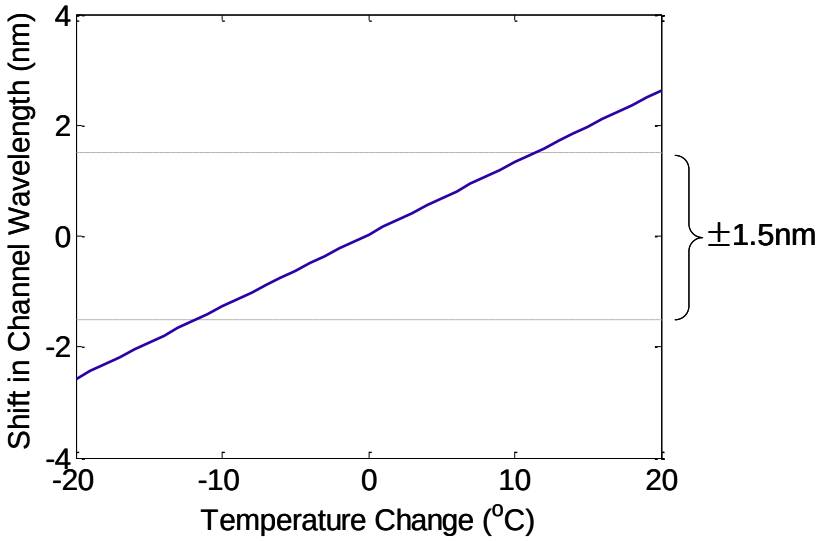

Fig. 7. Calculated shift in center wavelength for port 4 as a function of change in temperature.

required for active thermal stabilization since it is only required that the temperature is kept within this range to ensure that incoming data is routed to the correct ports without detriment. If desired however, thermal tuning of individual channel wavelengths may be performed to further counteract fabrication induced inaccuracies, and also to achieve reconfigurable add/drop multiplexers. Independent tuning of each channel may be performed thermally by placing microheaters on top of each add/drop filter [10].

4. Conclusions

We have demonstrated an add/drop filter based on coupled vertical gratings. Experimental characterization of fabricated devices shows the feasibility of tailoring channel bandwidth and wavelength. The add/drop filter concept is extended to implement a 1 by 4 WDM. Characterization of the fabricated WDM shows a 3dB bandwidth of 3nm, channel separation of 6nm, < 0.8dB ripple in the passband of each channel, an insertion loss of 1dB, and 16dB of interchannel crosstalk suppression. In addition, the device is ultracompact, having a footprint of $< 2 \times 10^{-9} m^2$. The demonstrated WDM is not FSR limited within the C-band, and may be further modified to increase its FSR to include the L-band. The large channel bandwidth reduces the energy required for active thermal tuning to reduce temperature fluctuations. The small device footprint, efficient allocation of bandwidth and potential for low power operation make the demonstrated WDM ideally suited for optical interconnects for implementation of next generation computer network architectures.

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