correct wavelength to the DFB laser or by thermally tuning the DI responses. This was successfully implemented as shown in Fig. 4(c). Figure 4(d) illustrates the BER curves for the 160Gb/s wavelength conversion. Error-free operation has been achieved for all the demultiplexed channels with power penalties ~4.6dB. The higher penalty value was attributed to the smaller AOWC output power which yields a higher OSNR degradation following signal post-amplification. An improved wavelength conversion performance is expected in the next generation devices due to a better alignment between SOA facet and SOI waveguide that will minimize losses. Figures 4(e) and 4(f) depict the spectrum traces of the final 160Gb/s inverted and non-inverted converted signals after DI offset filtering and probe carrier suppression respectively.

6. Conclusion

We have fabricated and system tested for the first time a hybrid all-optical wavelength converter integrated on a SOI substrate. The photonic chip performs inverted and non-inverted wavelength conversion up to 160Gb/s using a flip-chip mounted SOA and two concatenated SOI DIs. Error-free operation has been accomplished with power penalties less than 4.6dB.

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