Efficient Thermal Tuning Employing Metallic Microheater With Slow Light Effect

Thermal tuning acts as one of the most fundamental roles in integrated silicon photonics since it can provide flexibility and reconfigurability. Low tuning power and fast tuning speed are long-term pursuing goals in terms of the performance of the thermal tuning. Here we propose and experimentally demonstrate an efficient thermal tuning scheme employing the metallic metal heater. The slow light effect in the photonic crystal waveguide is employed to enhance the performance of the metal microheater. Meanwhile, the metal microheater is integrated on the side of the waveguide rather than on the top. Thanks to both the slow light effect and the side-integrated microheater, the tuning efficiency is significantly enhanced and the response time as fast as 2 µs is obtained. Since the thermal tuning with metal heater has been widely applied in silicon photonics, the proposed scheme may provide a valuable solution towards the performance enhancement of the thermal tuning in silicon photonics.

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