Optical MUX/DeMUX for Telecom Applications

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Abstract. Arrayed waveguide gratings (AWGs) are passive optical components which have found applications in a wide range of telecom, sensing, medical and other scientific areas. In modern fiber optic networks, they play an important role as optical multiplexers and demultiplexers. As multiplexers, they are used to combine different optical signals, each carrying a different information, on one optical fiber. Once the data have been transmitted over long distances, optical demultiplexers then split the optical signals back into separate wavelengths. This technology, known as Dense Wavelength Division Multiplexing (DWDM), allows an enormous amount of data to be transferred through just one optical fiber.

Low-index contrast AWGs (Silica-on-Silicon) feature many advantages such as low fiber coupling losses and low propagation losses. They are considered an attractive DWDM solution for all optical signal processing in optical communication systems. However, even so attractive the AWG design and fabrication are still a challenging task. In this work we will show how strong the AWG optical performance depends on both, the design and fabrication.

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