Segmented waveguide array grating filters

An optical device for filtering an optical signal is described. The optical filtering device comprises an optical input receiving the optical signal; an elongated waveguide connected to the input and having a modified transverse dimension to create a series of partially reflective segments having predetermined effective indices of refraction (neff) with a distribution within the waveguide to provide the filtering of the optical signal, wherein the segments are designed for single mode operation and wherein a reflected filtered output optical signal is generated, wherein the transverse dimension varies within a narrow range over which a transverse size of the mode remains close to its minimum value; an optical output connected to the waveguide for providing the filtered optical signal.