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APPLICATIONS OF BRAGG GRATINGS WRITTEN IN ETCHED FIBERS.

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In the recent years a large number of techniques have been developed to produce linearly chirped Bragg gratings. A novel technique based on tapering the fiber cladding in an etching bath has been recently reported, the variation of the fiber cross section results in a variation of the strain along the grating when the fiber is under tension, this strain gradient is used to chirp the grating. This technique has several advantages: apart from a good controllability resulting in high quality chirped gratings, it does not require active control, and it is highly versatile in producing a variety of chirp profiles. In this paper we report on the resultant chirp structures and applications from the versatility of this technique.

Linearly chirped gratings ideal for dispersion compensation and pulse shaping have been fabricated and a total chirp of 4.8nm has been demonstrated in a grating. The total chirp can be easily tuned by adjusting the strain applied to the fiber. The phase response of the gratings has been measured by an interferometric technique and the time delay shows a good linearity within the grating bandwidth.

This technique is suitable to produce gratings for DBF lasers and transmission band filters. Gratings with a transmission band in the middle of the reflection band have been fabricated, the transmission and reflection characteristics of the grating can be adjusted by tensing the fiber.

Other structures are currently being investigated: quadratic chirped gratings for high order dispersion compensation and phase modulated gratings for MDW.