# Light propagation in thermally expanded core fibers with graded-index

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Abstract

Light propagation is analyzed in thermally expanded core (TEC) fibers with graded-index profile. Used as power mixers among others, their core structure at the boundary between the heated and non-heated regions is represented by linear taper. Ray optics is used as the transverse taper dimensions are large relative to the wavelength of propagating light. Trajectories of meridian rays are derived analytically. Numerical results presented show ray trajectories as functions of the position within the taper and taper slope. These are modulated sinusoidal functions whose amplitude and period rise with the taper radius. Both, bound and leaky rays have been examined.

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