

Abstract Submitted  
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**Negative Power Subflows in High Contrast Step-Index Cylindrical Fibers** SERGIY MOKHOV, CREOL, UCF, Orlando, FL — Single-mode waveguides with high contrast between guiding and cladding refractive indices become experimentally available. Strong modal dispersion of them significantly changes properties of propagation of pulses. The hybrid-mode analysis of step-index cylindrical fiber expresses basic dispersion properties of fibers with high contrast. In this case analytical dispersion relation depends on dimensionless contrast and normalized frequency. It's interesting that the fundamental mode  $HE_{11}$  in fiber with contrast more than 2.7 can have the distribution of power flow with regions of negative values. This slightly investigated effect can have some nano-technological applications. The analytic form of dispersion equations for fibers with simple profiles are useful because propagation constants and their derivatives can be calculated with high accuracy. The problem of the coaxial step-index fiber is considered in details. Distortions of transversal electromagnetic fields are stronger due to the presence of the low index inner cylinder so the occurrence of negative power subflows is possible at smaller contrast in comparison with the simple step-index fiber.

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