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Channel Equalization and Bandwidth Tuning Using a LC-Based Tunable Hybrid Birefringent Filter

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ABSTRACT

We propose and demonstrate a new modified Lyot filter to independently ensure the channel amplitude equalization and the bandwidth tuning functions. The device consists of hybrid liquid crystal interferometers. We show numerically and experimentally that for a modified four-stage Lyot filter, the two first interferometers ensure equalization function with a maximum extinction ratio, while the last interferometer allows full-width at half-maximum tuning function by using, in particular, the optical canceling approach. Such a device is highly desirable in optical telecommunications, especially where in the core network the optical filters must perform several other functions in addition to their basic amplitude filtering action.

INDEX TERMS

- **IEEE Terms**

Bandwidth , Color , Interferometers , Optical filters , Optical interferometry , Telecommunications , Tuning

- **INSPEC**

- **Controlled Indexing**

light interference , liquid crystal devices , optical filters , optical tuning

- **Non Controlled Indexing**

LC-based tunable hybrid birefringent filter , Lyot filter , bandwidth tuning functions , channel amplitude equalization , channel equalization , hybrid liquid crystal interferometers

- **Author Keywords**

Amplitude equalization function , bandwidth tuning function , liquid crystal (LC) , polarization interference filter (PIF)

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