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Optical Microcavities: Recent Advances and Applications

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Abstract: High Q optical microcavities based on Whispering Gallery Modes (WGM) enable a number of applications as narrowband filtering, nonlinear optics, microlasers, and sensing. Microspheres and microcylinders made of Er/Yb doped optical fiber enable all-optical, pump-assisted, thermal tuning of high-Q WGM resonances. WGM resonances of an optical fiber itself define a unique tool for the characterization of fiber material and fiber components. Accurate characterization of thermal effects is possible, such as pump-induced temperature increase in doped optical fibers and thermal effects induced by an optical signal of moderate power along fiber gratings. WGM resonances permit a full characterization of the elasto-optic effect in optical fibers under axial strain, enabling a direct measurement of the anisotropy and the determination of the individual Pockels' coefficients.

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