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Wide actuation range cavity resonators based on MEMS

MICHAEL J. BURNS, JUAN M. MERLO, LUKE D'IMPERIO, MICHAEL J. NAUGHTON, Department of Physics, Boston College, Chestnut Hill, Massachusetts 02467, USA. — Color filters are an important component of current imaging research. One important approximation for color filtering was recently reported by Li, *et al.* [1]. Unfortunately, the principle employed does not allow the tuning of the cavity once it is fabricated. Here, we report a color filter by a different approach, using MEMS with actuation range on the order of hundreds of nanometers in spectral filtering. The fabrication process is based on photolithography, making it an easy to implement device. We show that the filtering area can be as large as $50 \mu\text{m}^2$, the actuation voltage on the order of several volts and the quality factor of about $Q=30$. Additionally, the tuning wavelength / voltage ratio is measured, in some of the samples, as 10 nm/V along the actuation range. Several applications are proposed, but we are particularly interested in the color filtering performance because of the wide range obtained. [1] Z. Li, *et al.* ACS Photonics 2, 183 (2016).

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