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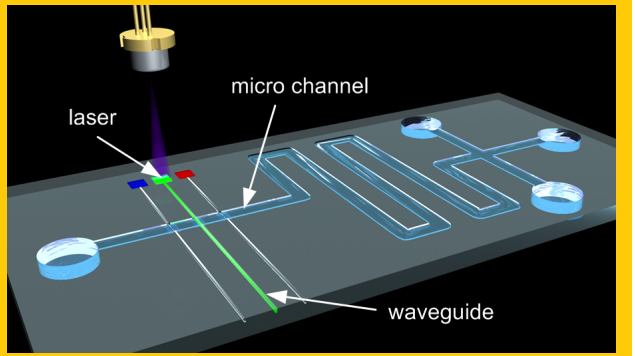
LASER & PHOTONICS REVIEWS

Abstract Solid-state organic amplifiers and lasers are attractive for hybrid integration due to their compatibility with different material platforms, straightforward processing, and possibility to optimize easily their optical and electronic properties by molecular engineering. Advances in the gain medium design and synthesis in combination with new resonator architectures led to tremendous improvements in temporal and spectral properties, lifetime stability, gains produced and operating threshold powers, which triggered interest in their use for a broad range of integrated photonic applications. In this contribution, the current state-of-the-art in the field of organic solid-state amplifiers and lasers is reviewed from the aspects of fabrication technology, gain materials, and device performance. Furthermore, examples of the progress of this technology from a laboratory curiosity to one that demonstrates practical integrated photonic applications are highlighted. An outlook is also provided on research areas and applications that are likely to shape further developments of this technology.



Organic solid-state integrated amplifiers and lasers

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