

A Spectrally Programmable Liquid-State Active System for High-Performance (SPLASH) Multicolor Lasing and White Emission

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Streszczenie

The development of a Spectrally Programmable Liquid-State Active System for High-performance (SPLASH) is introduced, which allows for multicolor lasing and White Emission. This completely liquid, three-phase device showcases exceptional tunability within a singular Liquid Crystal Cell (LCC). Components include a Coumarin 540 (CM540)-doped liquid crystal (LC) mesophase, an ionic liquid (RTIL) richly endowed with Rhodamine 6G (R6G) dye, and a Stilbene 420 (SB420)-infused water-based solution. This device displays significant accomplishments in multicolor tunability through the use of both lasing and fluorescence mechanisms. As a result, White Light Fluorescence (WFluo) and White Light Hybrid-Emission (WHE) are showed, which consist of two lasing bands and one fluorescence. This is achieved in a liquid-state environment characterized by phase separation and careful device management. Additionally, due to its fluid-like nature and compact design, the device inherently offers considerable scalability — since its components can be easily adjusted and rearranged. This approach promises ground-breaking advancements in high-impact applications such as the Li-Fi concept. Therefore, SPLASH stands out as an innovative platform for White Light Fluorescence (WFluo) and Multicolor Lasing (ML) within liquid-state active systems.

Słowa kluczowe

liquid crystals, liquid laser, random lasing, white emission, white fluorescence

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