3D mikrolaser

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Predstavljen bo 3D mikrolaser na osnovi tekočih kristalov, ki je bil prvič predstavljen javnosti v decembru 2010. To je barvilni laser v obliki mikrokapljice iz tekočega kristala s primesjo fluorescenčnega barvila, ki je postavljena v tekočino, s katero se tekoči kristal ne meša. Zaradi svoje narave se tekoči kristal uredi v notranjosti kapljice v obliki koncentričnih optično različnih plasti in tvori optični mikroresonator. Pri osvetljevanju z zunanjo svetlobo začne barvilo oddajati svetlobo, ki se v kapljici spontano ojačuje, kar privede do laserskega sevanja. Mikrolaser seva lasersko svetlobo v vse strani enakomerno, kar je prvi znani primer takšnega laserja v svetu. Pričakujemo, da bo mogoče mikrolaser uporabiti kot izvor svetlobe v holografskem mikroslikanju, predvsem pa raziskujemo njegovo uporabnost v optičnih mikrovezjih za optične telekomunikacije.

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The first 3D microlaser based on liquid crystals will be presented, that was demonstrated in December 2010. It is a dye-type microlaser in a form of a microdroplet of a liquid crystal doped with fluorescent dye, and dispersed in a liquid medium, that does not mix with the liquid crystal. Because of its nature, the liquid crystal self-organizes inside the microdroplet in a form of concentric shells with different optical properties, thus forming an optical microresonator. When illuminated with external light, the fluorescent molecules emit light, which is back-reflected from the concentric optical shells. This results in increased spontaneous emission and lasing. The microlaser emits light uniformly in 3D, and is the first laser of its kind ever developed. We expect that these microlasers be used as a light source in hollography, but more importantly, we explore their application in photonic microcircuits, where the flow of electricity will be replaced by the flow of light.