

Abstract Submitted
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Optoelectrofluidic field separation based on light-intensity gradients and its applications¹ JINSUNG YOON, SANGHYUN LEE, KWAN HYOUNG KANG, Pohang University of Science and Technology (POSTECH) — Optoelectrofluidic field separation (OEFS) of particles under light-intensity gradient (LIG) is reported, where the LIG illumination on the photoconductive layer converts the short-ranged dielectrophoresis (DEP) force to the long-ranged one. The long-ranged DEP force can compete with the hydrodynamic force by alternating current electro-osmosis (ACEO) over the entire illumination area for realizing effective field separation of particles. Results of the field separation and concentration of diverse particle pairs (0.82–16 μm) are well demonstrated, and conditions determining the critical radius and effective particle manipulation are discussed. In addition, expanding the OEFS to biological applications such as rapid cell manipulation and separation will be discussed. The OEFS with LIG strategy could be a promising manipulation method of particles including biological cells in many applications where a rapid manipulation of particles over the entire working area is of interest.

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