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Preparation of microfluidic chip with surface waves

This work deals with the design, fabrication and verification of microfluidic chips that can be used to sort particles using surface acoustic and standing surface acoustic waves. The sorting function of this chip is based on the piezoelectric properties of the substrate. For this reason, lithium niobate was selected as the substrate. The acoustic waves are generated by interdigital transducers placed directly on the surface of the substrate, which were fabricated by metal layer evaporation, optical lithography and reactive ion beam etching techniques. The microfluidic channels themselves were cast from a biocompatible polymer, polydimethylsiloxane, and subsequently bonded to the substrate with the interdigital transducers already prepared. The correctness of fabrication and assembly of the optimized microfluidic chips was subsequently verified experimentally by sorting polystyrene particles of different diameters.

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