

Abstract Submitted
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Acoustic manipulation of bacteria cells suspensions¹ SALOM GUTIRREZ-RAMOS, ESPCI-Paris, UPMC, MAURICIO HOYOS, JEAN LUC AIDER, CNRS, ESPCI-Paris, CARLOS RUIZ, CINVESTAV-MXICO, ACOUSTOFLUIDICS TEAM TEAM, SOFT AND BIO GROUP COLLABORATION — An acoustic contactless manipulation gives advantages in the exploration of the complex dynamics environment that active matter exhibits.

Our works reports the control confinement and dispersion of *Escherichia coli* RP437-pZA3R-YFP suspensions (M9Glu-Ca) via acoustic levitation. The manipulation of the bacteria bath in a parallel plate resonator is achieved using the acoustic radiation force and the secondary radiation force. The primary radiation force generates levitation of the bacteria cells at the nodal plane of the ultrasonic standing wave generated inside the resonator. On the other side, secondary forces leads to the consolidation of stable aggregates.

All the experiments were performed in the acoustic trap described, where we excite the emission plate with a continuous sinusoidal signal at a frequency in the order of MHz and a quartz slide as the reflector plate. In a typical experiment we observed that, before the input of the signal, the bacteria cells exhibit their typical run and tumble behavior and after the sound is turned on all of them displace towards the nodal plane, and instantaneously the aggregation begins in this region.

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