Contribution ID: **393** Type: **Oral Presentation**

Capillary Wave Tweezers

Monday, 30 May 2022 17:50 (15 minutes)

Particle manipulation in a liquid has many applications at different length scales: from size-based particle sorting in industrial production processes to cellular manipulation for bio-sensing and analysis in microfluidic lab-on-a-chip devices. Many active methods employing various external fields, such as, optical, acoustic, magnetic and electrical have been used for tweezing particles, particle clusters and biological cells in a liquid volume [1,2,3,4]. However, these devices generally require complex and costly fabrication procedures and operations.
In this work, we use low frequency vibrations (~100 Hz) via capillary waves as efficient tweezers to control particle movement in a liquid volume. We demonstrate a mechanism to manually control the position of capillary wave nodes in an open liquid volume. We demonstrate that the capillary waves trap particles underneath their nodes and the particles follow these nodal positions as the capillary waves are displaced in the liquid volume. We also characterise the effects of liquid volume, actuation amplitude and frequency on the particles' movement. This newly developed platform provides an adaptable solution to the collection and manipulation of microparticles in biomedical or chemical applications.

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References

References:
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Time Block Preference

Time Block B (14:00-17:00 CET)

Participation

Online

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Session Classification: MS06-B

Track Classification: (MS06-B) Interfacial phenomena in multiphase systems