

Abstract Submitted  
for the DFD14 Meeting of  
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**Control of microparticles packing density in a microfluidic channel for bead based immunoassays applications**<sup>1</sup> GABRIEL CABALLERO-ROBLEDO, PABLO GUEVARA-PANTOJA, CINVESTAV-Monterrey, PIIT 66600, Nuevo Leon, Mexico — Bead based immunoassays in microfluidic devices have shown to greatly outperform conventional methods. But if functional point-of-care devices are to be developed, precise and reproducible control over the granulate packings inside microchannels is needed. In this work we study the efficiency of a nanoparticles magnetic trap previously developed by B. Teste et al. [Lab Chip 11, 4207 (2011)] when we vary the compaction of micrometric iron beads packed against a restriction inside a microfluidic channel. The packing density of the beads is finely and reproducibly changed by applying a vibrational protocol originally developed for macroscopic, dry granular systems. We find, counterintuitively, that the most compact and stable packings are up to four times less efficient in trapping nano particles than the loosest packings.

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