On-chip measurement of the Brownian relaxation frequency of magnetic beads using magnetic tunneling junctions - DTU Orbit (20/12/2018)

On-chip measurement of the Brownian relaxation frequency of magnetic beads using magnetic tunneling junctions
We demonstrate the detection of the Brownian relaxation frequency of 250 nm diameter magnetic beads using a lab-on-chip platform based on current lines for exciting the beads with alternating magnetic fields and highly sensitive magnetic tunnel junction (MTJ) sensors with a superparamagnetic free layer. The first harmonic out-of-phase component of the MTJ response gives the imaginary part of the magnetic bead susceptibility, which peaks at the Brownian relaxation frequency. This work paves the way to on-chip implementation of Brownian magnetorelaxometry in innovative "lab-on-a-bead" assays for biomolecular recognition. (C) 2011 American Institute of Physics. [doi:10.1063/1.3554374]

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