Measurements of Brownian relaxation of magnetic nanobeads using planar Hall effect bridge sensors - DTU Orbit (13/12/2018)

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We compare measurements of the Brownian relaxation response of magnetic nanobeads in suspension using planar Hall effect sensors of cross geometry and a newly proposed bridge geometry. We find that the bridge sensor yields six times as large signals as the cross sensor, which results in a more accurate determination of the hydrodynamic size of the magnetic nanobeads. Finally, the bridge sensor has successfully been used to measure the change in dynamic magnetic response when rolling circle amplified DNA molecules are bound to the magnetic nanobeads. The change is validated by measurements performed in a commercial AC susceptometer. The presented bridge sensor is, thus, a promising component in future lab-on-a-chip biosensors for detection of clinically relevant analytes, including bacterial genomic DNA and proteins.

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