Abstract Submitted
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Single bacterial cell detection with nonlinear rotational frequency shifts of driven magnetic microspheres[1] BRANDON MCNAUGHTON, University of Michigan, Physics Department, RODNEY AGAYAN, University of Michigan, Applied Physics Program, RON SMITH, RAOUL KOPELMAN, University of Michigan, Chemistry Department, ROY CLARKE, University of Michigan, Physics Department — Shifts in the nonlinear rotational frequency of magnetic microspheres, driven by an external magnetic field, offer a dynamic approach for the dynamic detection of single bacterial cells. We demonstrate this capability by measuring such frequency shifts when an *Escherichia coli* attaches to the surface of a 2.0 micron magnetic microsphere, thereby affecting the drag of the system. From this change in drag, the nonlinear rotation rate was reduced, on average, by a factor of 3.8. Sequential bacterial attachments were also monitored using this approach.

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