Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Molecular stress sensors constructed from DNA** MEENAKSHI PRABHUNE, Third Institute of Physics-Biophysics, Georg August University, Goettingen, JONATHAN BATH, ANDREW J. TURBERFIELD, University of Oxford, Department of Physics, Clarendon Laboratory, Parks Road, Oxford OX1 3PU, UK, FLORIAN REHFELDT, CHRISTOPH F. SCHMIDT, Third Institute of Physics-Biophysics, Georg August University, Goettingen — Molecular stress generation in cells is spatially and temporarily organized in complex patterns to drive meso-scale active processes such as intracellular transport, cell migration, or cell division. To quantitatively understand how these processes are driven, it is necessary to map local stresses inside cells, which is hard due to the lack of appropriate probes. We have designed a molecular-scale probe consisting of a self-assembled DNA hairpin with a fluorophore - quencher pair that responds to small forces (pN) applied to its ends. We demonstrate the working of this force sensor *in vitro* and explore possibilities for *in vivo* application to map local stress fields in cells.

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Date submitted: 14 Nov 2014 Electronic form version 1.4