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Live-cell thermometry with nitrogen vacancy centers in nanodiamonds HARISHANKAR JAYAKUMAR, Department of Physics, CUNY-City College of New York, HELMUT FEDDER, Department of Physics, University of Stuttgart, ANDREW CHEN, LIUDI YANG, CHENGHAI LI, Department of Biomedical Engineering, CUNY-City College of New York, JOERG WRACHTRUP, Department of Physics, University of Stuttgart, SIHONG WANG, Department of Biomedical Engineering, CUNY-City College of New York, CARLOS MERILES, Department of Physics, CUNY-City College of New York — The ability to measure temperature is typically affected by a tradeoff between sensitivity and spatial resolution. Good thermometers tend to be bulky systems and hence are ill-suited for thermal sensing with high spatial localization. Conversely, the signal resulting from nanoscale temperature probes is often impacted by noise to a level where the measurement precision becomes poor. Adding to the microscopist toolbox, the nitrogen vacancy (NV) center in diamond has recently emerged as a promising platform for high-sensitivity nanoscale thermometry [1,2]. Of particular interest are applications in living cells because diamond nanocrystals are biocompatible and can be chemically functionalized to target specific organelles. Here we report progress on the ability to probe and compare temperature within and between living cells using nanodiamond-hosted NV thermometry. We focus our study on cancerous cells, where atypical metabolic pathways arguably lead to changes in the way a cell generates heat, and thus on its temperature profile. 1. V. Acosta et al., *Phys. Rev. Lett.* **104**, 070801 (2010). 2. G. Kucsko et al., *Nature* **500**, 54 (2013).

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