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**Low-power, fast, selective nanoparticle-based hydrogen sulfide gas sensor**[1] ALLEN SUSSMAN, Department of Physics, University of California at Berkeley, Berkeley, California 94720, USA, WILLIAM MICKELSON, Center of Integrated Nanomechanical Systems, University of California at Berkeley, Berkeley, California 94720, USA, A. ZETTL, Department of Physics, University of California at Berkeley, Berkeley, California 94720, USA — We demonstrate a small, low-cost, low-power, highly sensitive, and selective nanomaterials-based gas sensor. A network of tungsten oxide nanoparticles is heated by an on-chip microhotplate while the conductance of the network is monitored. The device can be heated with short pulses, thereby drastically lowering the power consumption, without diminishing the sensor response. The sensor shows high sensitivity to hydrogen sulfide and does not have significant cross sensitivities to hydrogen, water, or methane, gases likely to be present in operation. A sensing mechanism is proposed, and its effect on electronic properties is discussed.

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