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Strain-gradient dominated emission energy shift of pure-bending ZnO wire DAPENG YU, XUEWEN FU, XIAOBING HAN, QIANG FU, Peking University, WANLIN GUO, ZHUHUA ZHANG, Nanjing University of Aeronautics and Astronautics, PEKING UNIVERSITY COLLABORATION, NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS COLLABORATION — High special/energy resolution cathodoluminescence (CL) spectroscopy enables us to make precise investigation on the optical/electronic fine structures in nanostructures. The linear distribution of strain gradient from tensile to compression in bent ZnO nano/microwires provides ideal conditions to address the modification of the electronic structures by strain in semiconductor materials. Radial line scan of the CL spectroscopy along bent ZnO wires at liquid helium temperature shows very fine excitonic emission structures, which demonstrates systematic red shift towards the increase of tensile strain, and blue shift as well as excitonic peak splitting towards the increase of compressive strain. Strain-gradient is found to dominate the overall red-shift of the emission energy at a pure bending configuration.

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