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Structural Characterization and Transport Properties of GaN nanowires in non-serrated and newly discovered serrated morphologies[1]
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We present results on the synthesis, structural characterization and transport properties of single crystal GaN nanowires in two different morphologies (non-serrated and serrated nanowires). The synthesis of these two types of nanowires is carried out in chemical vapor deposition with Au catalysts. Different from the regularly non-serrated GaN nanowires, the GaN nanowires in "serrated" morphology have been newly discovered by our group. By controlling the growth conditions, it has been demonstrated that GaN nanowires with regular periodic serrations along the surface of the nanowire can be produced under specific conditions as for large-sized Au catalysts and excess concentration of gallium oxide. Detailed structural and morphological characterization studies reveal interesting features for these two growth modes. In an attempt to understand how these structural and morphological variations impact the electrical properties, transport studies on single GaN nanowires (both serrated and non-serrated) are currently underway. The transport properties, namely current versus voltage will be obtained for such nanowires which in turn will reveal important information on the potential applications of such wires in optoelectronic devices.

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