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Carrier dynamics in semiconductor nanowires studied using optical-pump terahertz-probe spectroscopy

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The advance of non-contact measurements involving pulsed terahertz radiation presents great interests for characterizing electrical properties of a large ensemble of nanowires. In this work, InP and Si nanowires grown by molecular beam epitaxy or by chemical vapor deposition on silicon substrates were characterized using optical-pump terahertz probe (OPTP) transmission experiments. The influence of various fabrication parameters (v.g. doping and NW diameter) on the carrier dynamics has been investigated. Photocarrier lifetimes and mobilities can be extracted from such OPTP measurements.

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