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Polarization and Interface Effects on THz Emission from c-plane InGaN/GaN Heterostructures NATHANIEL WOODWARD, CHAD GALLINAT, RYAN ENCK, GRACE METCALFE, HONGEN SHEN, MICHAEL WRABACK, U.S. Army Research Laboratory — Nitride semiconductors have strong piezoelectric and spontaneous polarizations, which, when terminated at a heterointerface, create a large internal electric field. This field enables transport-based THz radiation with intensities comparable to that from conventional contactless semiconductor surface emitters such as InAs. We observed THz emission from 200-nm thick c-plane InGaN coherently strained to various doped GaN substrates due to photocarrier acceleration toward the surface in the field resulting from the polarization charge at the InGaN/GaN interface. We compare THz emission from the samples pumped from the substrate side as well as the epilayer side such that diffusive and polarization field-induced transport were in the same and opposite directions, respectively. When pumped from the substrate side, we observed several spectral features that did not appear when pumping the InGaN surface. These features may be attributed to effects from the InGaN/GaN heterointerface.

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