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Enhanced THz emission from stacked $+c$-plane InGaN/GaN heterostructures grown by plasma-assisted molecular beam epitaxy CHAD GALLINAT, NATHANIEL WOODWARD, RYAN ENCK, GRACE METCALFE, HONGEN SHEN, MICHAEL WRABACK, US Army Research Laboratory — We have previously demonstrated THz emission in a single, fully-strained 200 nm InGaN layer grown on GaN. This emission was due to the acceleration of electrons toward the surface in the piezoelectric polarization charge-induced electric field. We observed a reduction in the THz emission from a fully relaxed InGaN layer where the piezoelectric polarization was removed. In order to increase the InGaN layer thickness to maximize the absorption of the excitation pulse, we introduced GaN spacers to limit strain relaxation. We observed an increase in THz emission strength from samples with three stacks of coherently strained 100 nm/10 nm InGaN/GaN layers over the emission from single layer structures. We explored the balance of In alloy content, InGaN layer thickness and InGaN layer strain to maximize the piezoelectric polarization for enhanced THz emission.

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