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Effect of dislocation density on superluminescence of GaN epitaxial layers grown by organometallic gas-phase epitaxy on sapphire substrates

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The radiative properties of GaN epitaxial layers grown by organometallic gas-phase epitaxy on sapphire substrates have been studied. The samples were excited by a high-current electron beam with an energy density of 0.4 J/cm^2. The correlation of the intensity of superluminescence with the density of dislocations has been established. It is shown that with a decrease in the density of dislocations on the long-wavelength wing of spontaneous luminescence, a peak of superluminescence is formed, the intensity of which increases with a decrease in the density of dislocations.

Keywords: GaN, dislocation density, high-current electron beam, superluminescence.

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