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Modeling the optical constants of AlN and 6H-SiC

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Paper Abstract

Optical constants of hexagonal AlN in the range 6-20 eV and 6H-SiC in the range 1-30 eV for the component perpendicular to the c axis are modeled using modified Adachi's model of the optical properties of semiconductors. Model parameters are determined by acceptance-probability-controlled simulated annealing. Main distinguishing feature of the model employed here is the use of variable broadening instead of the conventional Lorentzian one. In such a manner, broadening function can vary over a range of functions with similar kernels but different wings. Therefore, excessive absorption inherent to Lorentzian broadening can be reduced so that better agreement with experimental data can be achieved. Relative rms errors for the real and imaginary parts of the index of refraction, respectively, equal 3.5% and 5.2% for 6H- SiC and 1.5% and 1.9% for AlN.

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