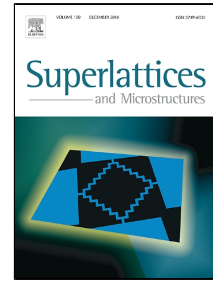


# Accepted Manuscript

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# *Diameter Dependent* Polarization in ZnO/MgO Disk-in-Wire Emitters: Multiscale Modeling of Optical Quantum Efficiency

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## Research Highlights

- ❖ ZnO nanoscale emitters offer several advantages over conventional GaN counterparts
- ❖ Multiscale study of coupled effects of size-quantization, atomicity, and polarization fields
- ❖ Conventional polarization models *overestimate* the internal fields and degradation
- ❖ This study considers a first-principles derived *size-dependent* model for polarization
- ❖ Piezoelectric potential is large and tends to cancel out the pyroelectric counterpart
- ❖ The new model leads to an improved efficiency and optical emission characteristics

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