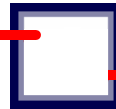




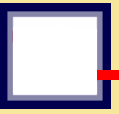
Al GaN SuperLattice Phonons



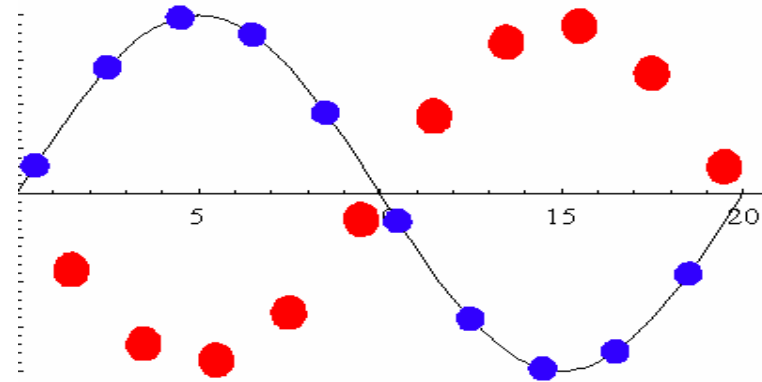
By: Joseph Herzog



Phonons



- **Phonons are important in semiconductor physics because they greatly affect the thermal and electrical conductivities in solid state devices:**
 - **Heat Dissipation**
 - **Electron Scattering**



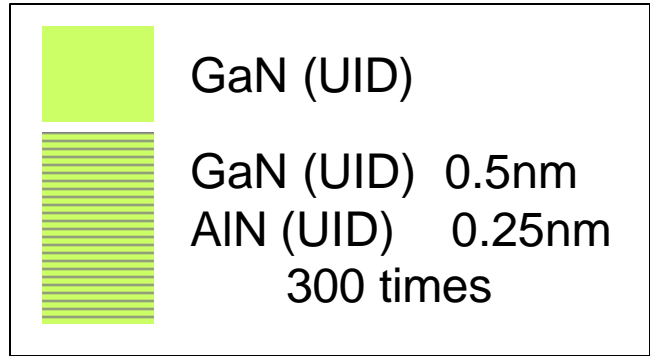
Transverse Optical (TO) Phonon



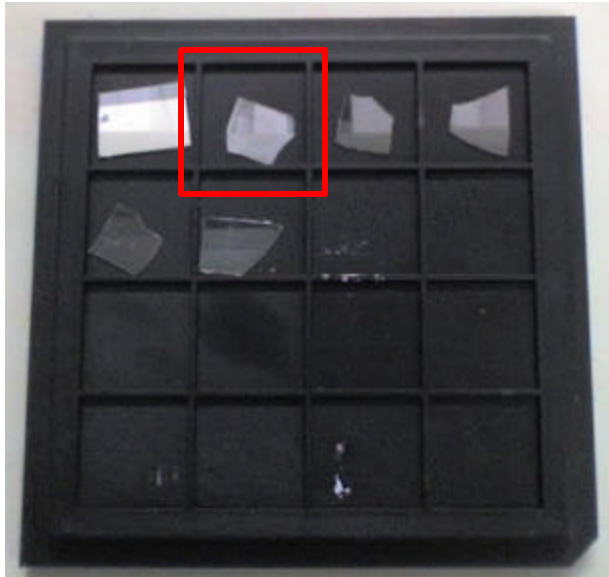
- **Phonon dispersion relationship are well-known in Bulk AlN and Bulk GaN**
- **Also, phonon properties have been studies in Superlattices (SL).**
- **Yet, there is still more to learn about phonons in AlN/GaN SL**



Sample AlN/GaN SL

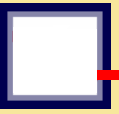


301.3nm





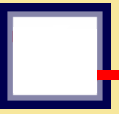
Problems to Solve



- **With the use of SLs, can we engineer phonons at specific energies?**
- **How can you measure phonon energies with IR spectroscopy?**
- **How do SL interfaces affect phonons?**
- **What structural information can we gain from phonons?**
- **What is the cause of unexpected phonons.**



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Reflectance Spectra

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