**Predicting Thermal Conductivity of Defected Systems using Spectral Energy Density**

Predicting the thermal conductivity of dielectric materials requires a detailed description of phonons, which are quantized lattice vibrations. These phonons can be thought of as an interacting (non-ideal) gas. Common techniques use the periodicity of “pure” crystalline systems to analyze the properties of this “phonon gas”. However, these techniques break down when the system’s periodicity is broken (i.e. defected). Spectral Energy Density can analyze the phonon properties of these defected systems if the defects are a small perturbation.