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Electron-phonon interaction in the polymeric superconductor, polysulfur nitride, $(SN)_x$. PAUL M. GRANT, W2AGZ Technologies — In early 1975, superconductivity at temperatures between 0.3 – 0.4 K was discovered in the inorganic polymer, polysulfur nitride, $(SN)_x$. The compound itself was originally synthesized in the first decade of the 20^{th} century, but its transport properties went largely undetermined until their investigation was sparked by the emergence of the low dimensional layered organic charge transfer salts in the decade of the 1980s. The issue of why the transition temperature of $(SN)_x$ is so low has not been adequately addressed computationally, especially in view of the realization of superconductivity at nearly 40 K in magnesium diboride, MgB_2, in 2001, a compound whose electronic structure is remarkably similar to $(SN)_x$, in that both are two-band, hole-electron semimetals with low-dimensional Fermi surface topologies. In this talk, we report our results on the calculation of the electron-phonon dispersion relation,$\alpha^2F(\omega)$, for $(SN)_x$ obtained from the application of recently available DFT algorithms capable of accurately treating screening of electron-phonon interactions in metals.

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