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ELECTRON-PHONON INTERACTION AT THE TL-SI(111) SURFACE FROM FIRST-PRINCIPLES.

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The influence of spin-orbit coupling (SOC) on the electron-phonon interaction (EPI) is investigated for the Tl-Si(111) surface from first-principles based on density-functional and density-functional perturbation theory (DFT and DFPT) and a plane-wave basis pseudopotential method. We present electronic and vibrational band structures of the Tl-Si(111) surface. EPI is analyzed within the Green Function's formalism using the Migdal approximation. The limitation of the Eliashberg approximation is also studied for this kind of systems.