

Abstract Submitted  
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**Stability Constraints and Local Criteria for the Bounds on  $T_c$  of Conventional Superconductors**<sup>1</sup> JONATHAN E. MOUSSA, MARVIN L. COHEN, University of California at Berkeley and Lawrence Berkeley National Laboratory — In the regime of weak electron-phonon coupling, the scale of and bounds on  $T_c$  are set by the real phonon frequencies of a material. In the strong coupling limit of Eliashberg theory, the phonon frequencies no longer limit the transition temperature because  $T_c$  can grow without bound as  $\sim \sqrt{\lambda\omega_{ph}}$ , where  $\lambda$  is the electron-phonon coupling parameter. However, structural stability of the system puts bounds on  $T_c$  even in the strongly coupled regime due to the softening of phonons. In this case,  $T_c$  is also bounded by an averaged un-renormalized phonon frequency defined for a non-metallic precursor material. Additional features of this model will also be discussed.

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