

Abstract Submitted
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**Anomalous Isotope Effect in Low and High Tc Superconductors:
the contribution of the electronic structure** G.L. ZHAO, Southern University
and A&M College — Some of the low and high Tc superconductors exhibit an
anomalous isotope effect, where the exponent (α) for the isotope effect is much
smaller than $1/2$. We present first-principles calculations of the electronic structures
of the selected superconductors, including Zirconium (Zr) and $\text{YBa}_2\text{Cu}_3\text{O}_7$ (YBCO).
The characteristically narrow electron bands around the Fermi levels (E_f) in these
materials suggest that the rapid variations of the densities of states around E_f ,
within the range of phonon energy, can have a noticeable effect on the total coupling
matrix elements. Such effect may explain the anomalous isotope effect on Tc in
these superconductors. The work is funded in part by NSF and the Air Force Office
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