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Thermodynamic properties of cuprate superconductors: Singularities and Pseudogaps. JAMES STOREY, MacDiarmid Institute, Victoria University, JEFFERY TALLON, GRANT WILLIAMS, MacDiarmid Institute, Industrial Research Ltd — We have calculated the entropy and superfluid density of Bi-2212 from an ARPES-derived rigid energy dispersion and a model for the normal-state pseudogap. Their detailed doping and temperature dependence is found to closely mimic the experimentally measured data, thus indirectly validating the ARPES data. The doping level at which the Fermi level crosses a van Hove singularity (vHs) is determined and found to agree with that inferred from ARPES. The superfluid density is found to be linear in T at the vHs crossing. Surprisingly, the doping dependence of T_c seems to be unaffected by crossing the singularity.

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