A Correlation between Specific Heat Capacity, Grüneisen Parameter and Phase changes within 400 – 700 km of the Earth

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The discontinuities within the upper mantle (400 – 700km) are well established from seismological measurements. We present here an analysis of the seismic primary (v_p) and secondary (v_s) velocity data of Jeffreys-Bullen and density data in terms of thermophysical properties of materials such as specific heat capacity (C_P), Grüneisen parameter (ξ) and Debye temperature (Θ_D). Our preliminary results computed from thermoelastic and thermodynamic equations show a very good correlation between the phase changes within the upper mantle and the thermophysical properties of the minerals therein. Our analysis has clearly identified two discontinuities at average depths of 414km and 645km which are in fair agreement with the presently accepted depths 410km and 670km from PREM model data.