

# Constraining Geotherms and the CMB Temperature

# Disagreement on T at CMB

- Shock wave data is very large  
Temperatures up to **7000K!**
- T is too large in mantle convection models and melting temperature suggested by geochemistry

1. Mineral physics tell us **bulk properties** of mantle materials at depth to infer a geotherm (from the top).  
---How much **minor elements/water** can change the T/Q/melting/elastic properties result?
2. Constraints from Geodynamics to give a range of T at CMB that is consistent with the measurements geochemists see at hot spot affected ridges (i.e. melting temperatures in plumes that start at CMB)
3. Chemical variability of plumes can affect the T calculated (?).

4. Seismology can use geodynamic models to obtain **predicted velocities** and then compare to **real seismic velocities**.
5. Geochemistry might say something about T at CMB (i.e. core temperature) by analysing meteorites (?)
6. Can short-lived isotope systems that record core formation tell us something about elements in the core formation (**What is in there??**)

7. How well is heat flow at surface known – the distribution? Do we need more measurements?

---Can we improve this estimate?

8. If CMB T is too hot (for geodynamicists) could an **insulating process** due to primitive material account for this?