#### Stalled slab

Model group **B**, displayed in Figure **¿fig:model\_results?**‌b and Figure **¿fig:model\_tracers?**‌b, tracks the potential thermal structure of oceanic plates stalled under the forearc at successive times. Each run begins at a specified time with the subduction of oceanic lithosphere assigned an initial thermal structure corresponding to the Global Depth and Heat model [*Stein and Stein*, 1992] for oceanic lithosphere of qa given age of oceanic crust.

***(we should track the entire model run, and then at the end of this section cover the Monterey plate case)*** The "Monterey plate" scenario is a subset of these models entailing hypothetical northward lateral translation on a low-dipping subduction megathrust. Neglecting shear heating (which appears to be minor, e.g. *Kidder et al.* [2013]), this scenario can be modeled as a young endmember stalled-slab scenario, and is shown as the youngest model of **B**. Potential Monterey Plate mantle lithosphere beneath Crystal Knob would have begun its generation as an oceanic plate (emplaced under the ridge-***get ALL references to oceanic lithosphere being “emplaced under spreading ridge” OUT of this manuscript-it is conceptually wrong!***) at 27 Ma (corresponding to the chron 7 magnetic anomaly) and subducted shortly thereafter [*Atwater and Stock*, 1998; *Wilson et al.*, 2005].***(I do not see 27 Ma, nor anything that adds up to 27 Ma on Fig. 22. I see that 22 + 5 = 27 on Fig. 23, but Figure 22 and its caption must stand on their own. The caption of fig. 22 has very little useful information that can be correlated to the plots. In Figure 22-B you cannot decipher which is the age of subduction or age of lithosphere being subducted. On B, what is the difference between Tend and FINAL 1.65 Ma)***

***(this paragraph is bass ackwards-first we should cover all the modle runs, and then point out that the MP is the last run-special case)***In addition to the Monterey plate scenario, a series of older cooling scenarios are modeled, representing a wide range of potential timings for backstepping of the subduction megathrust and underplating of a slice of mantle lithosphere. Covarying subduction time and age of oceanic crust are constrained by *Seton et al.* [2012] and represent different phases of Farallon plate subduction beneath the coast of Southern California. Though these scenarios represent plausible thermal histories, only the "Monterey plate" construction can be tied to geodynamic and geological evidence of a specific episode of subduction instability.

These scenarios result in cooler geotherms than the shallow slab window underplating, (falling within the spinel stability field***-Don’t all of your modeled geotherms in a-c fall in the spinel stability field? Isn’t it the thermobarometricallt determined geotherm that we are testing for here, and not the spinel stability field?)*** at the temperature of xenolith entrainment [Figure **¿fig:model\_comparison?**]. The Monterey plate subduction scenario predicts a modern geotherm that coincides with the entrainment constraints on the Crystal Knob xenoliths.