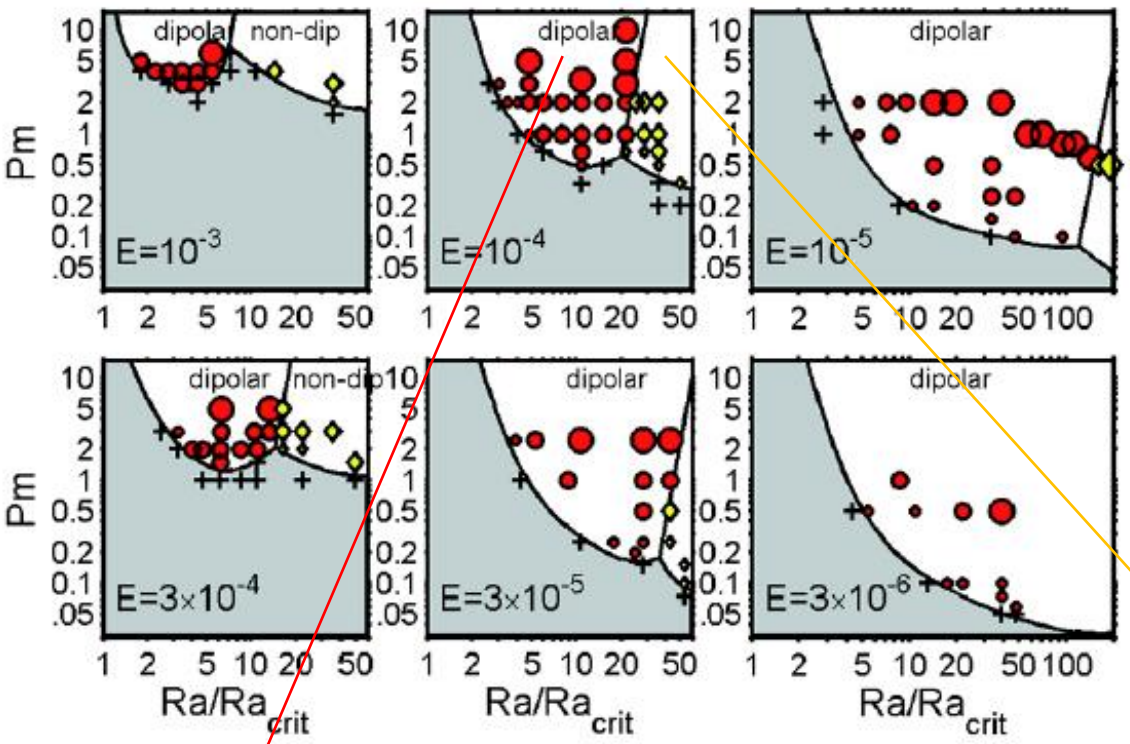
ANR DYRE-COMB:
DYnamo REgimes dependence on the heterogeneous COre-Mantle Boundary heat flux

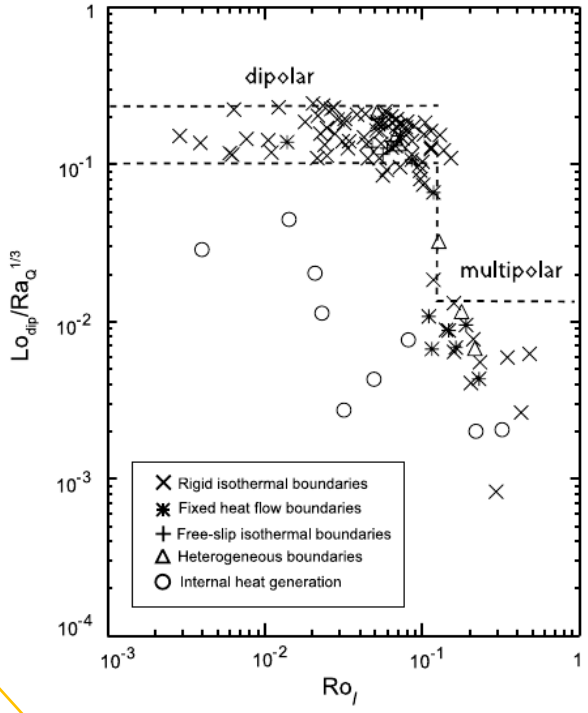
LPG Nantes, EOST Strasbourg, LMV Clermont-Ferrand, external (Brazil, Taiwan, Germany)

Budget: 392 keuros

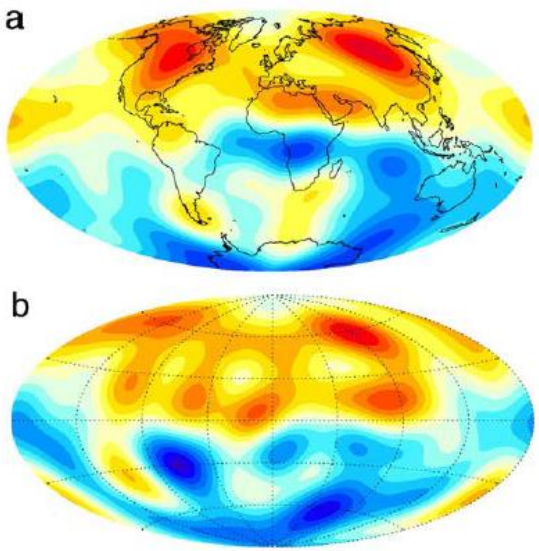
Main demands: Two postdocs (1 in LPG, 1 in EOST)

Start: 1/4/2023

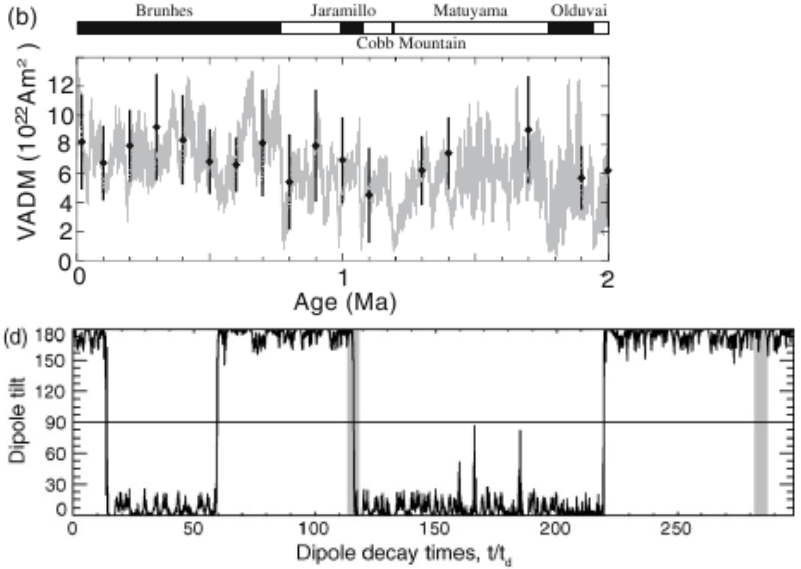


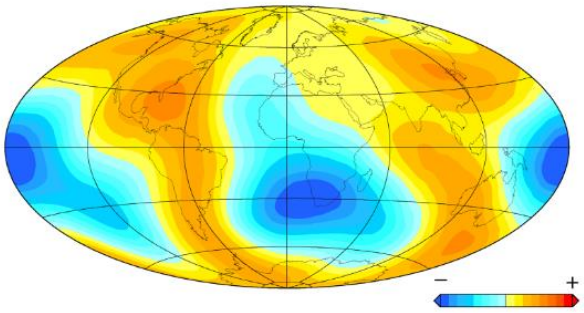


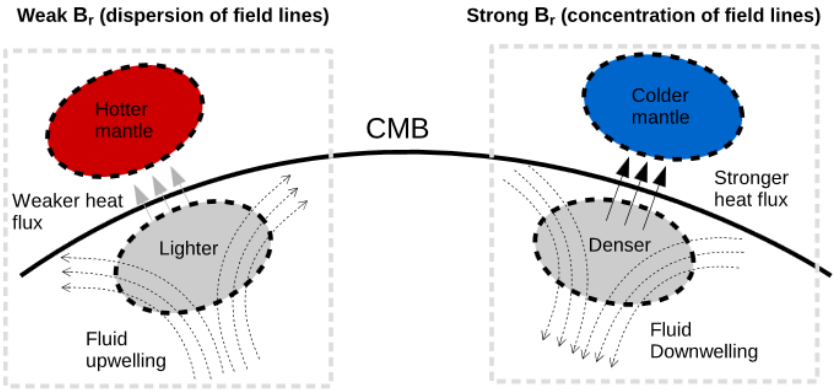
Dynamo regimes (left, Christensen and Aubert, 2006) and their transition (right, Olson and Christensen, 2006).

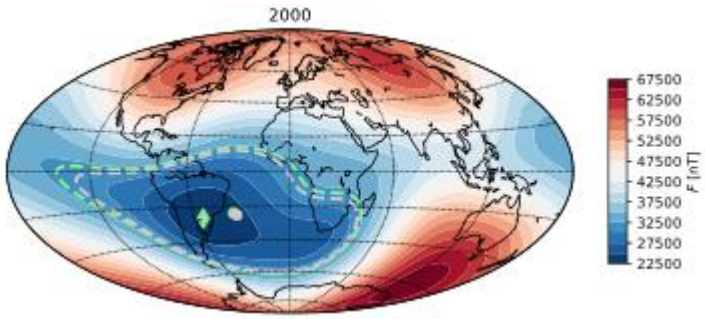


Observation-based models (top) vs. dynamo **simulations** (bottom) of **field morphology** (left, Christensen et al., 2010) and **reversals** (right, Olson and Amit, 2006; Olson et al., 2009).

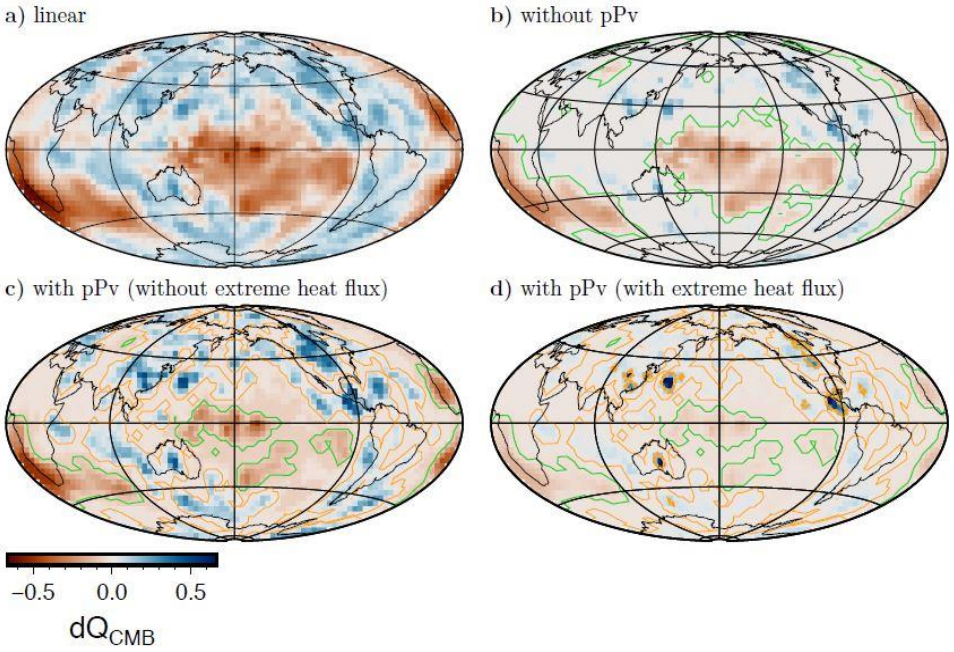






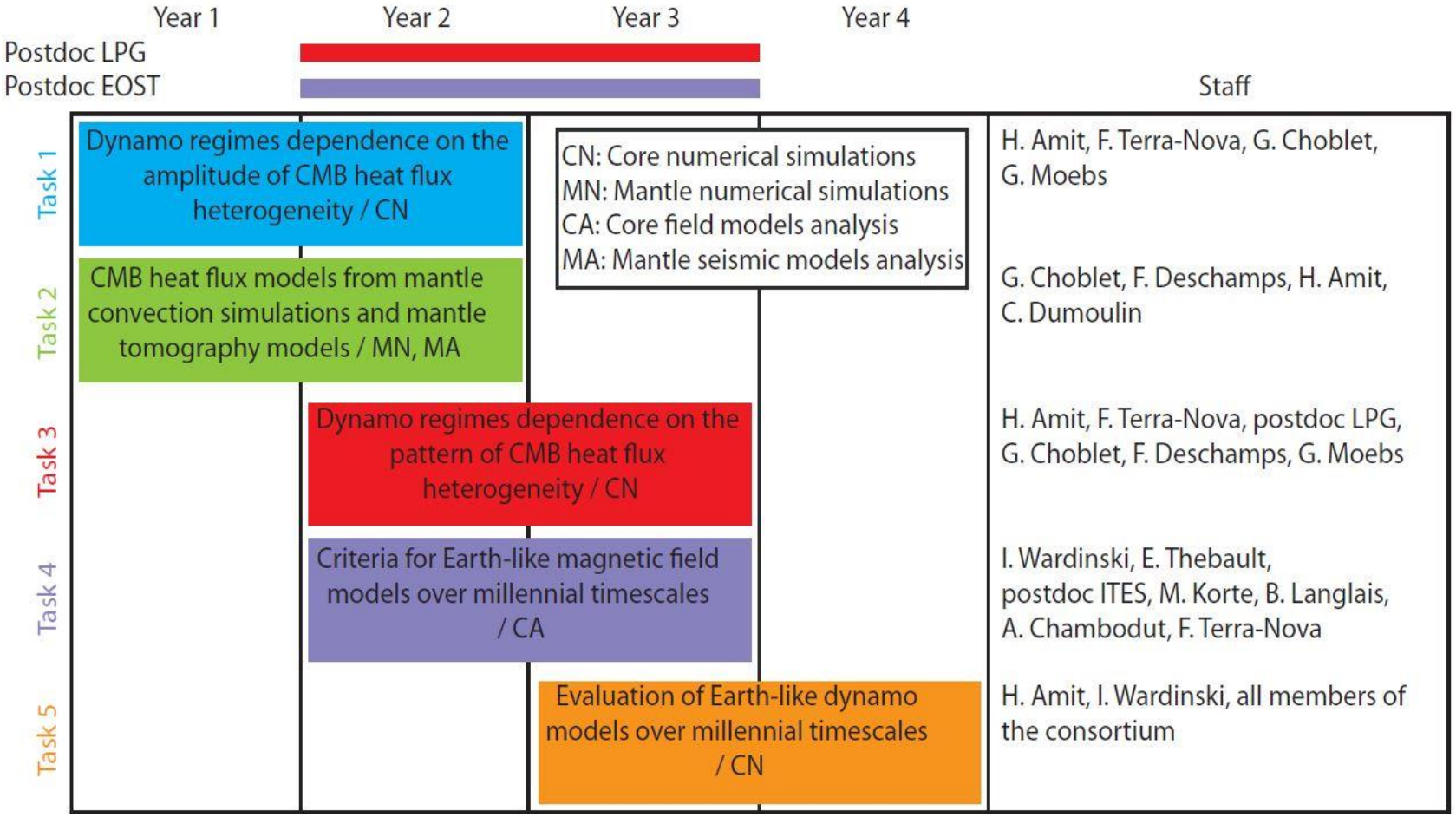


Heterogeneous CMB heat flux inferred from **D'' seismic anomalies** (top, Masters et al., 2000) affect **core convection** and the **geomagnetic field** (middle, Terra-Nova et al., 2019) by e.g. localizing **surface intensity minima** (bottom, Amit et al., 2021).



However, accounting for **non-thermal** (compositional, mineralogical) contributions to lower mantle seismic anomalies may lead to **different CMB heat flux patterns** (Choblet et al., in preparation).

DYRE-COMB objectives and consortium



- **Numerical dynamo simulations:** Terra-Nova, Amit, Choblet, Moebs.
- **Mantle convection simulations and seismic models:** Choblet, Deschamps, Amit, Dumoulin.
- **Geomagnetic field models:** Wardinski, Thébault, Korte, Langlais, Chambdout, Terra-Nova.

Program:

10:30-11:00 - Cafe

11:00-11:30 - Opening words (Hagay)

11:30-12:30 - CMB heat flux modelling from mantle convection simulations (Frederic)

12:30-13:30 - Lunch

13:30-14:30 - Geodynamo regimes dependence on the amplitude of CMB heat flux heterogeneity (Filipe)

14:30-15:30 - Earth-like criteria from archeomagnetic field models (Ingo)

15:30-16:00 - Summary (all)