Modeling orbital forcing to constrain carbon cycle feedbacks
PETM and background orbital forcing

Ocean Drilling Program Site 1262, South Atlantic

Benthic δ\textsuperscript{13}C

Benthic δ\textsuperscript{18}O

Data: Litter et al., (2014)
Model PETM carbon injection
Model PETM environmental change

Kirtland Turner, 2018
Orbital Forcing across the PETM

PETM onset

- 55.27 Ma
- 55.93 Ma
- 55.53 Ma
- 55.39 Ma
Model PETM with orbital forcing

Model forced by La2004 orbital solution plus CO$_2$ emissions of C$_{org}$ (-22‰) to match a prescribed δ$^{13}$C curve (black line below) at various relative timings.

CO$_2$ emissions:
- PETM @ 55.93 Ma
- PETM @ 55.53 Ma
- PETM @ 55.39 Ma
- PETM @ 55.27 Ma

Temperature curve:
- δ$^{13}$C over time (kyr)
- Berthel Temperature (°C)