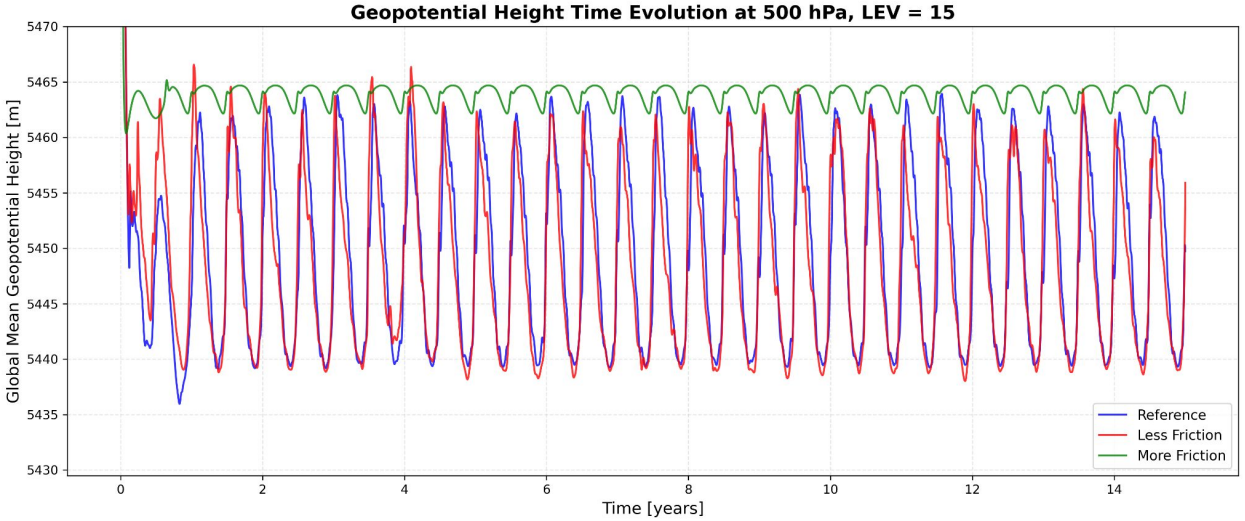
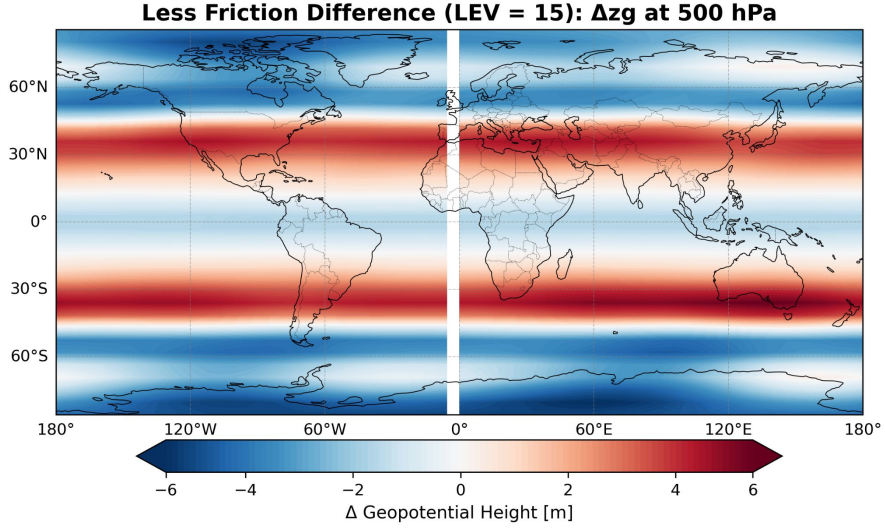
# Effects of Friction & Diffusion on Synoptic Circulation Patterns

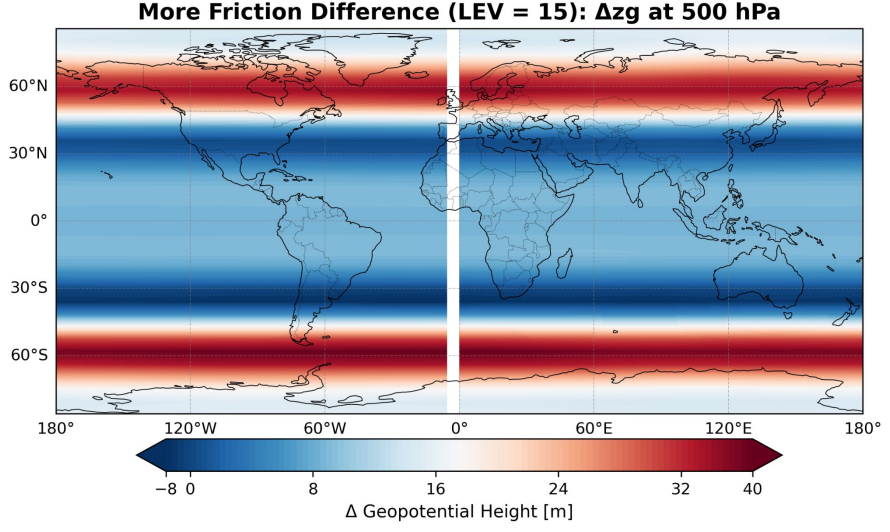
| Reference | *lessfric* | *morefric* |
|---|---|---|
| TAUTA = 40 days | 80 days | Unchanged |
| TAUTS = 4 days | 8 days | Unchanged |
| DIFFTS = 21600 s | 43200 s | 8640 s |
| DVDIFF = 0 $m^2/s$ | Unchanged | 10 $m^2/s$ |
| LEV = 15 | 15 | 15 |

- Model: PUMA
- 15 year scenario (with 1 year spinup)

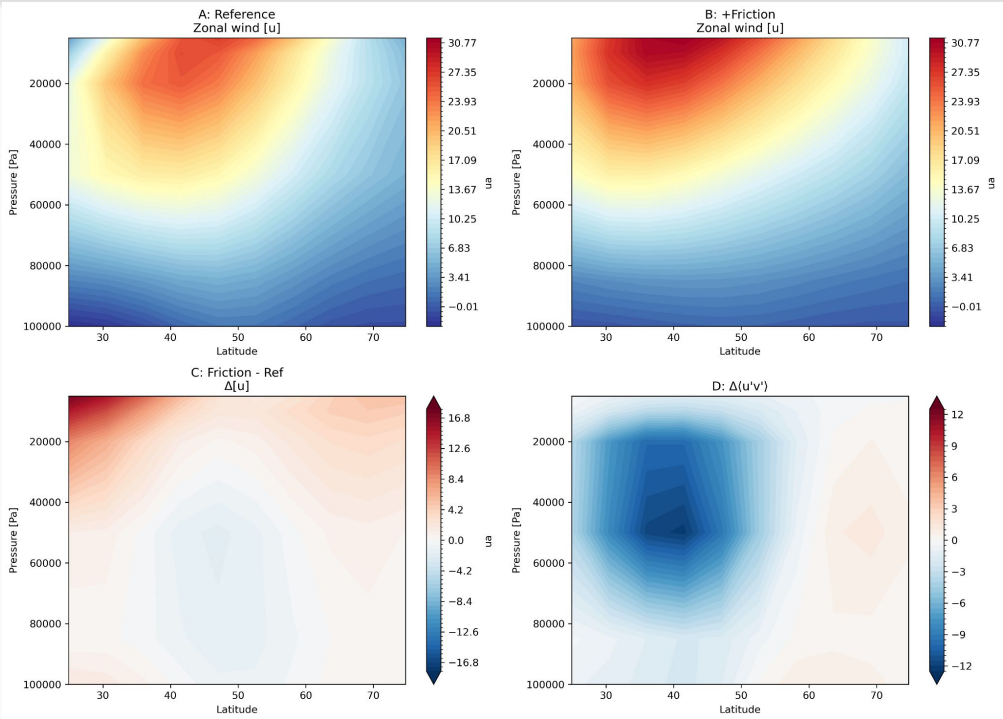
- Analyzed variables:
  - Geopotential height
  - In mid-latitudes:
    - Zonal winds
    - Eddy momentum flux


Geopotential Height Time Evolution at 500 hPa, LEV = 15
Global Mean Geopotential Height [m]
Time [years]
Reference
Less Friction
More Friction


Less Friction Difference (LEV = 15): Δzg at 500 hPa
60°N
30°N
0°
30°S
60°S
180°
120°W
60°W
0°
60°E
120°E
180°
Δ Geopotential Height [m]


More Friction Difference (LEV = 15): Δzg at 500 hPa
60°N
30°N
0°
30°S
60°S
180°
120°W
60°W
0°
60°E
120°E
180°
Δ Geopotential Height [m]

# Effects of increased Friction on zonal winds and Eddy flux




- Jet shifts to equator
- Increased zonal wind speeds in higher atmosphere (< 400 hPa)
- Decreased zonal wind speeds in lower atmosphere at latitudes around 50°N
- Decreased eddy momentum flux at latitudes 20°N - 50°N