Case study of a moutain wave

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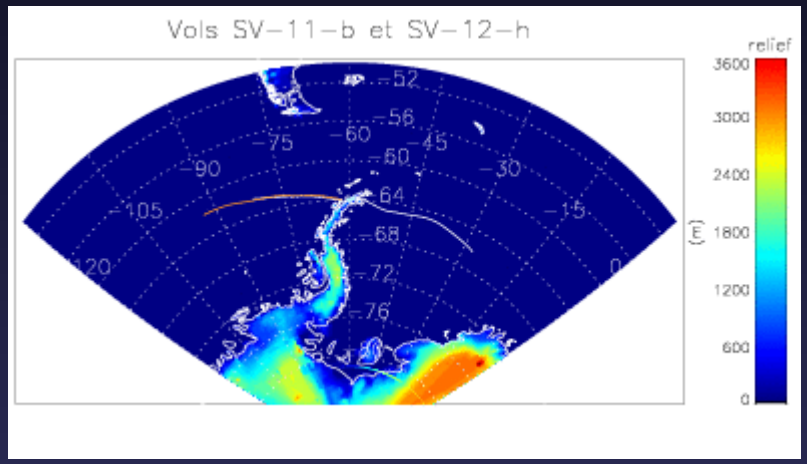
Outline

- Observations
- Numerical simulations

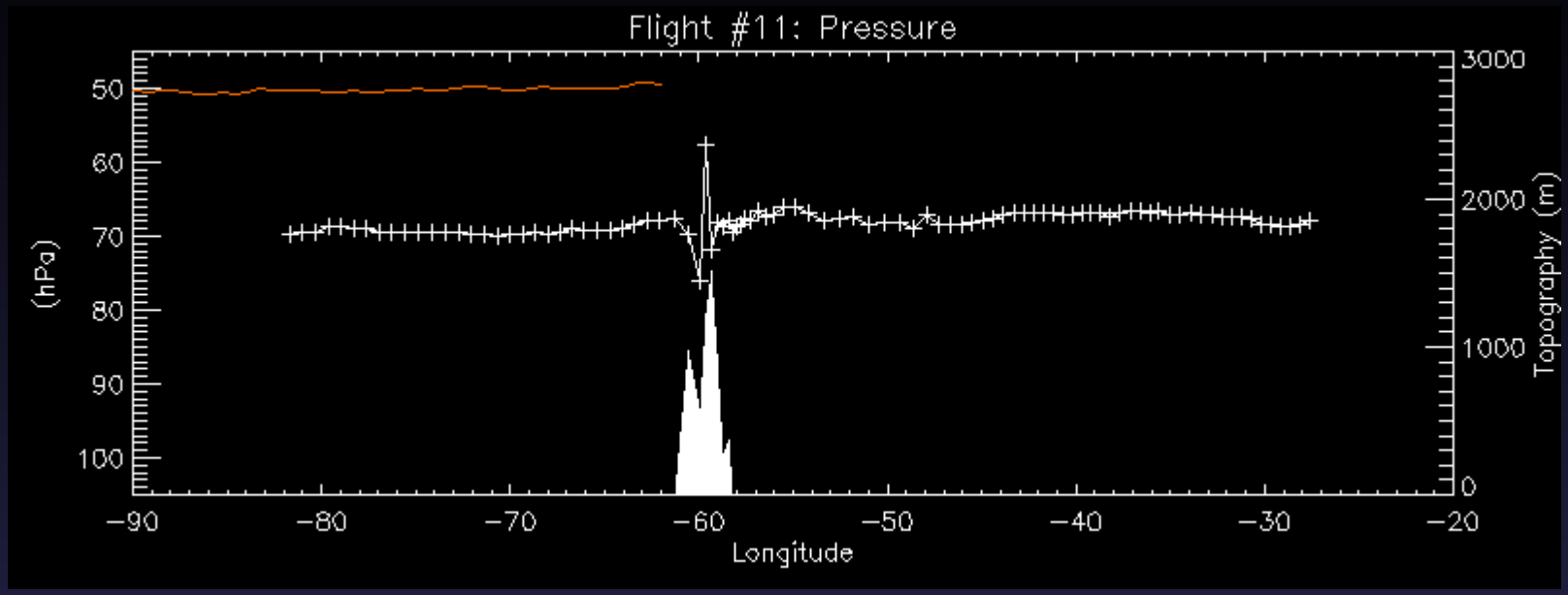
Observations

- On October 7, 2005, a balloon (flight #12)burst when passing over the Antarctic Palmer Peninsula
- It was preceded 4 hours before by flight #11



Observations

- Pressure observations of flight #11

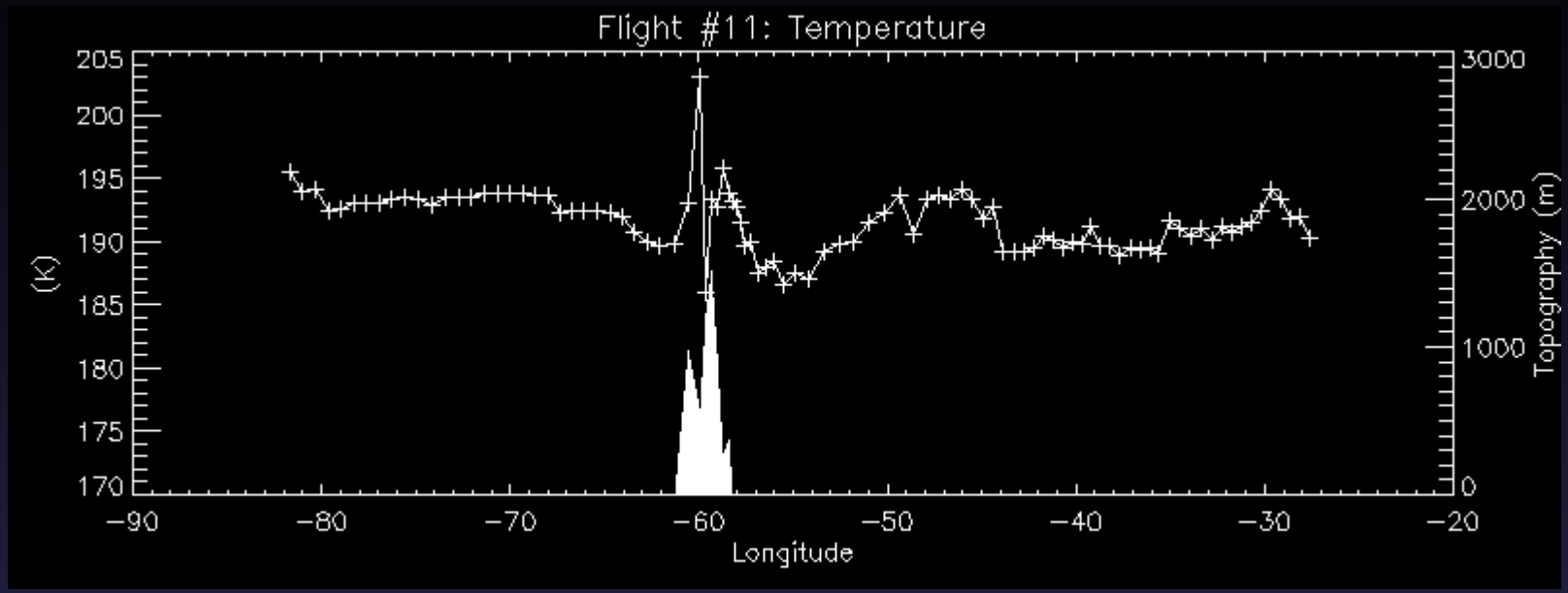


Pressure fluctuations of ~18 hPa
=> corresponding helium overpressure fluctuations
Intrinsic period of 30 min.

Flight #12 passed over the moutains at sunset

Observations

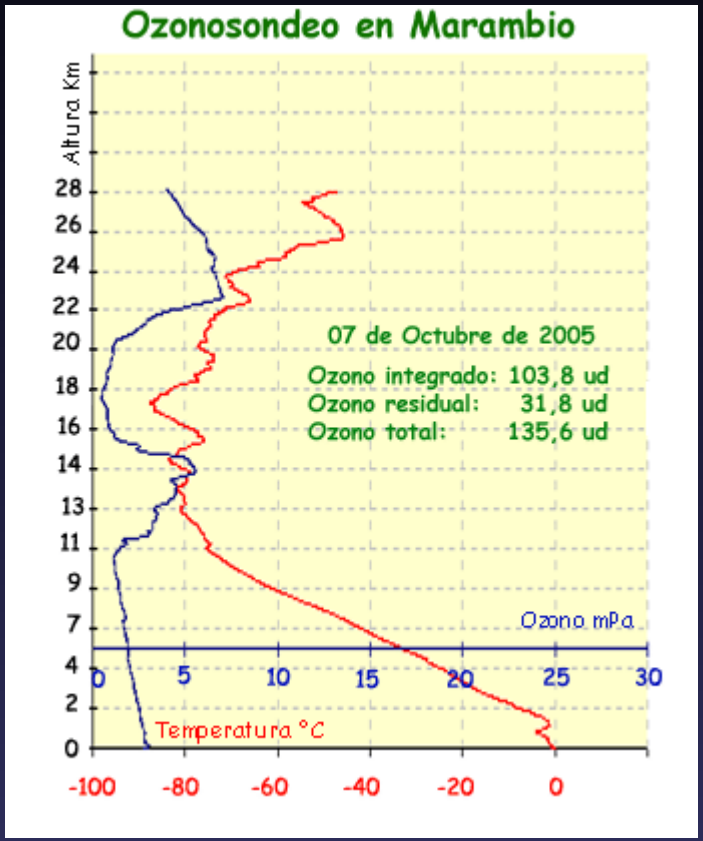
- Temperature observations of flight #11

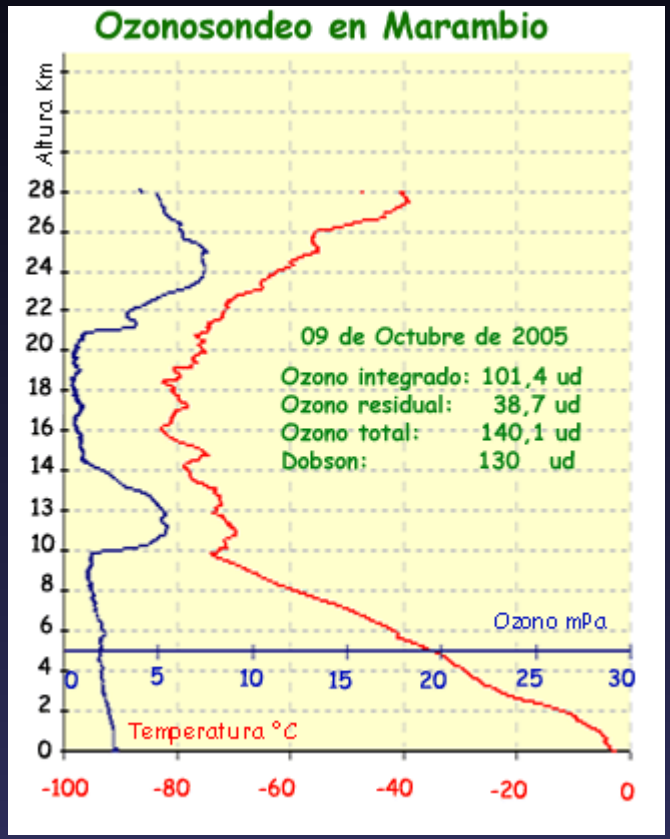


Temperature fluctuations of ~17 K

Observations

- Ozone radiosoundings at Marambio, on the lee side of Palmer Peninsula



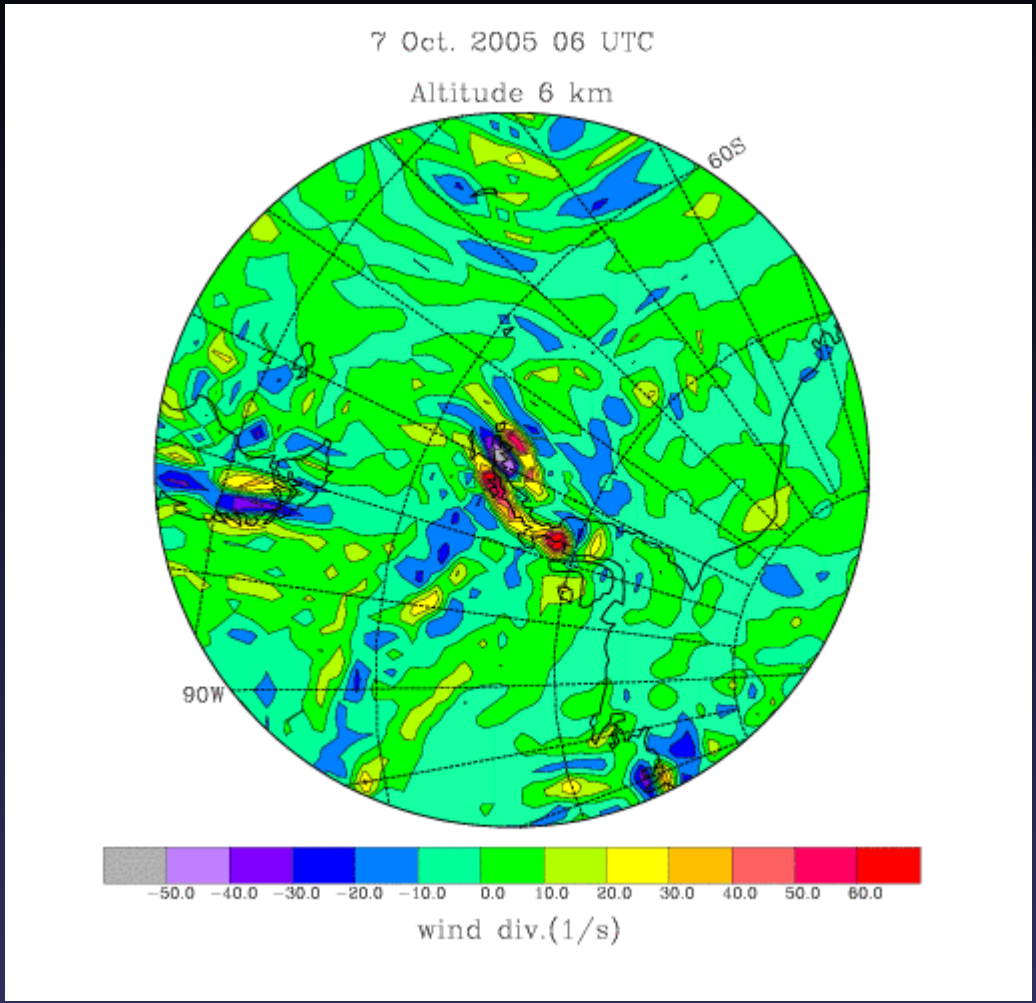


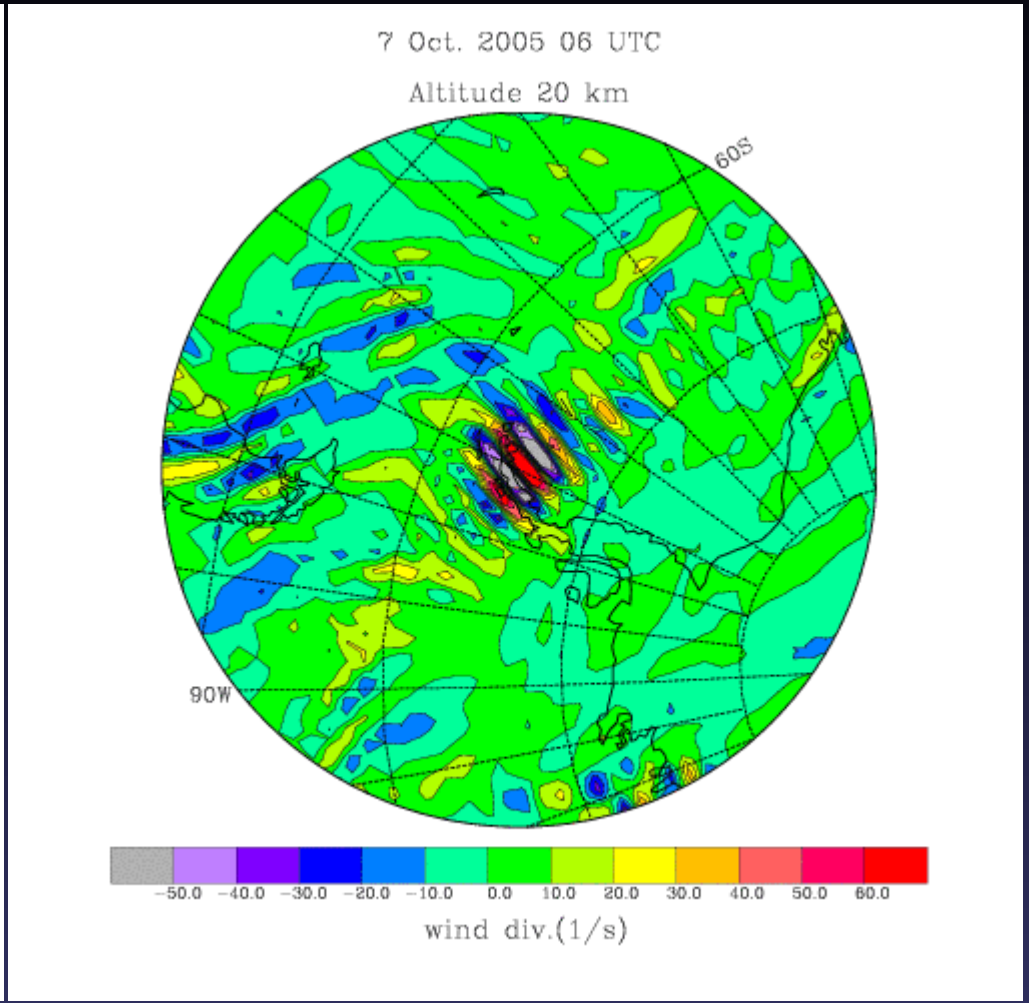
Numerical simulations

- 2 types of models
  - ECMWF analyses
    - 0.5° x 0.5° horizontal resolution
    - 60 vertical levels
  - WRF mesoscale model
    - 20 km x 20 km resolution
    - 75 vertical levels
    - Possibility of nested simulations, with an inner finer grid (6 km)

ECMWF

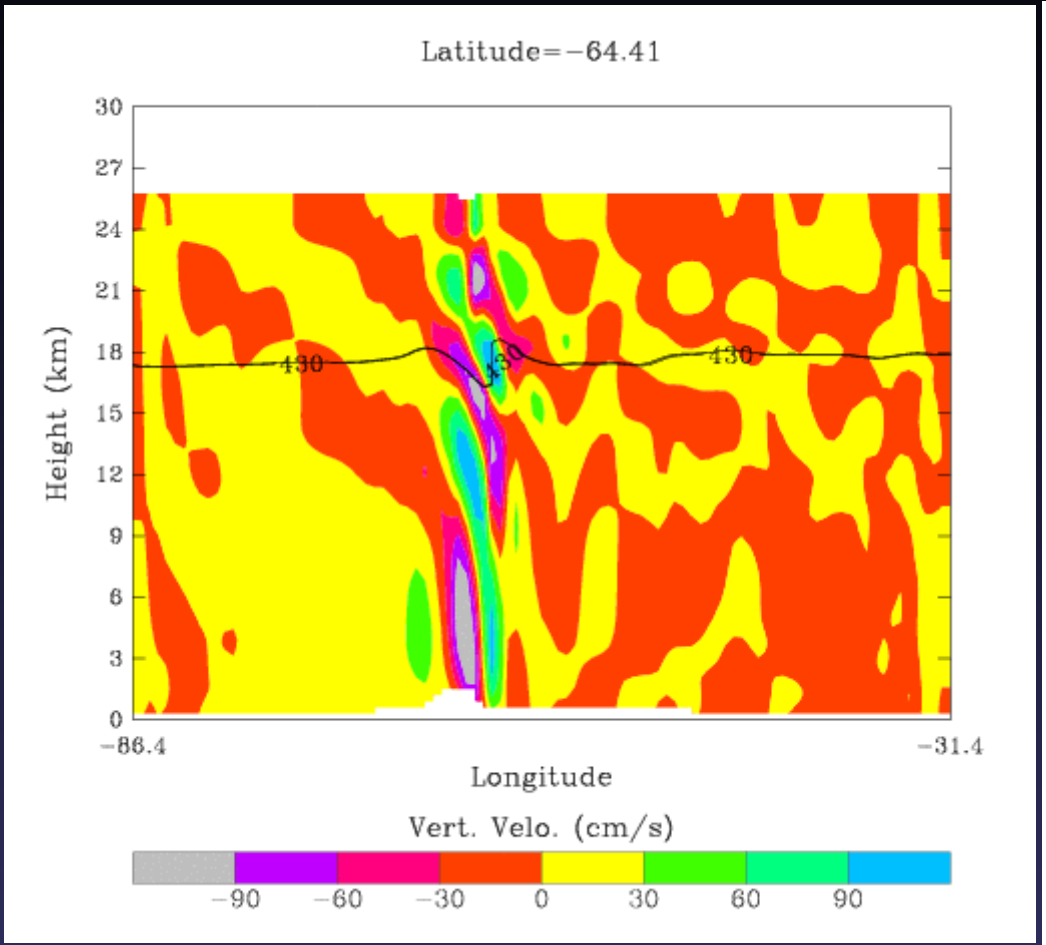
- Wind divergence

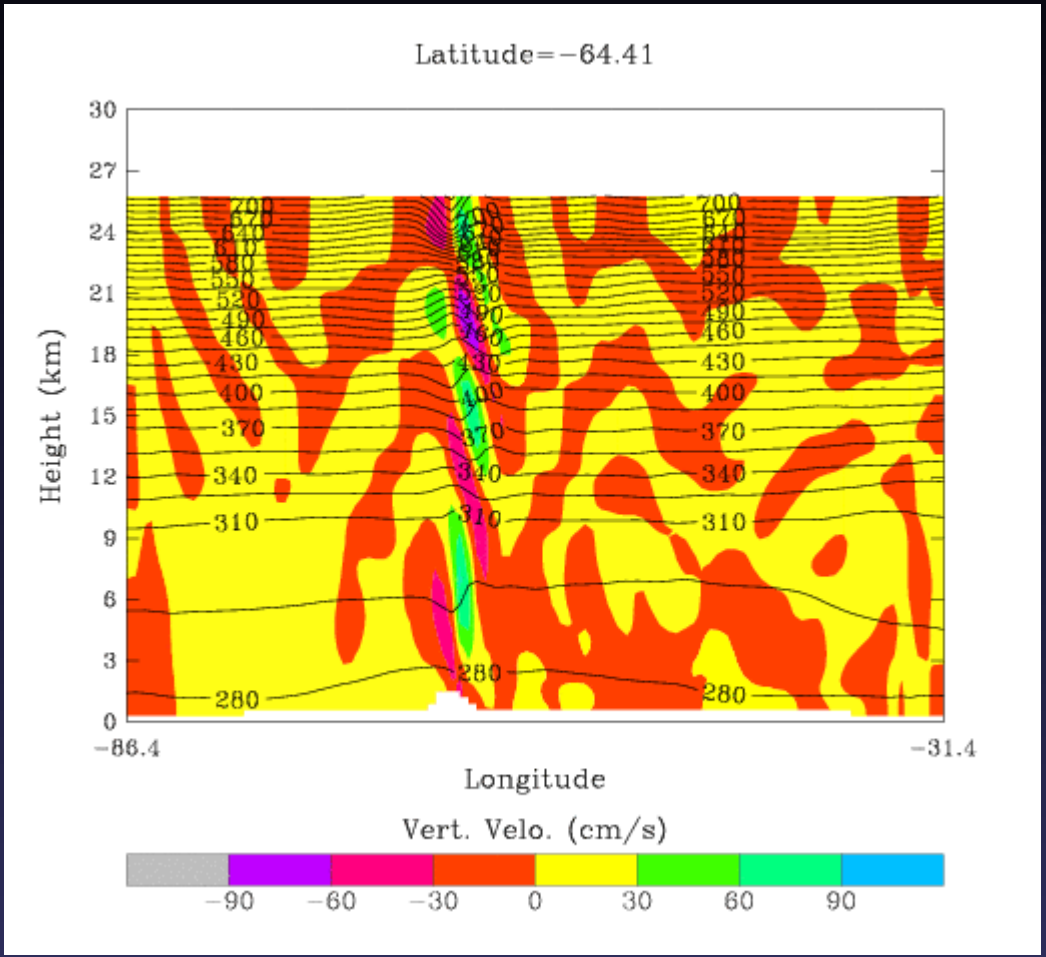




WRF

- Vertical velocity





Conclusions

- Further simulations at finer scales
- Comparisons with balloon observations
  - Wave characteristics
  - Momentum flux