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**The influence of the stratosphere polar vortex dynamics**  
**on a low troposphere thermal stratification.**

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**Влияние динамики стратосферного полярного вихря**  
**на температурную стратификацию нижних слоев**  
**тропосферы**

**ИВМиМГ СО РАН**

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## Simulation scenario / Сценарий моделирования

With use of with zonally symmetric forcing, the sensitivity of extratropical troposphere circulation to the thermal disturbances of polar stratosphere was investigated.

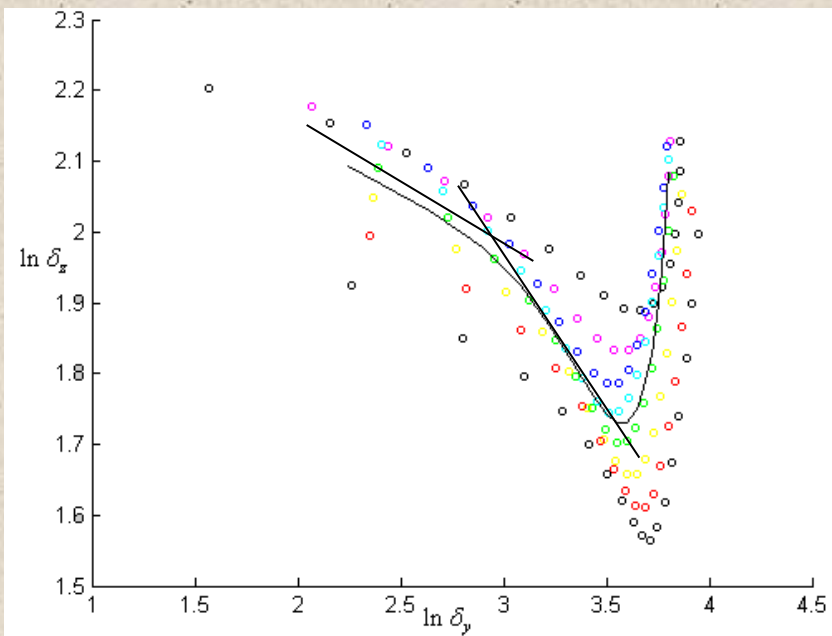
Thermal source is given in Newton's form with a determined profile of a radiative equilibrium temperature depending on latitude and pressure

The integration is conducted for 4 years of a model time with a spectral resolution T42 and 31 levels on vertical

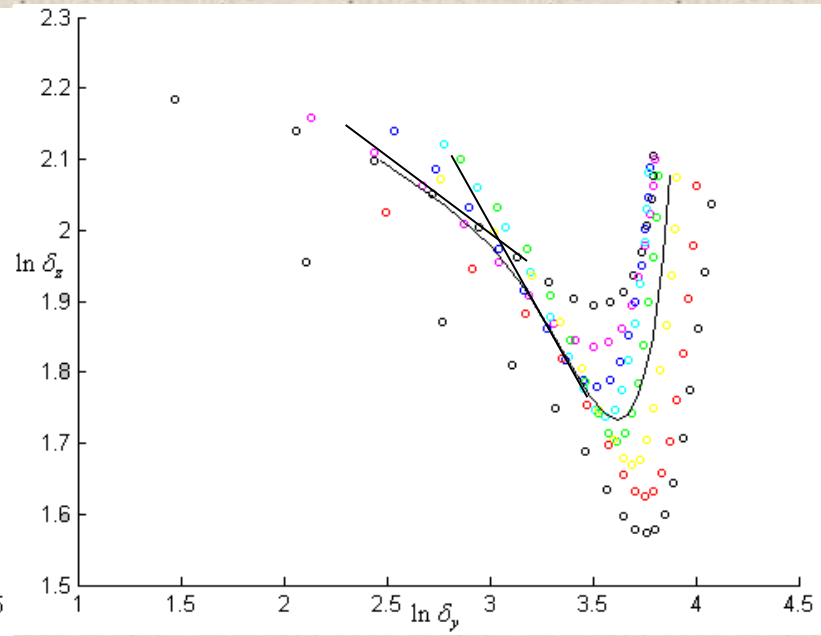
The isentropic surfaces slope.

$$\delta_y = -a \frac{\partial \bar{\theta}}{\partial y} \quad \delta_z = H \frac{\partial \bar{\theta}}{\partial z} \quad \theta = T \left( \frac{p_s}{p} \right)^\gamma$$

- ◻ 60,0
- ◻ 57,2
- ◻ 54,4
- ◻ 51,6
- ◻ 48,8
- ◻ 46,0
- ◻ 43,3
- ◻ 40,5



$\Gamma=0$



$\Gamma=4$

## Conclusion

In this paper, the sensitivity to the tropospheric dynamics to variations of a condition of a polar stratosphere is investigated.

Change of temperature stratification at strengthening of the cooling in the stratosphere influences in the top troposphere where stratification is defined by radiating processes.

In the bottom layers of troposphere where the considerable contribution to dynamics bring baroclinic non-stationary eddies, a local slope of the isentropic surfaces remains invariable and it accords to the theoretical estimation

The zonally symmetric component of the reaction of the low troposphere to disturbances of the stratosphere polar vortex can be the result of acting the baroclinic waves of the synoptic scale even in the absence of planetary waves.