

Documentation for LMDZ, Planets version

The upper boundary sponge layer

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1 Practical aspects in the code

The sponge layer is applied at the upper boundary when the `ok_strato` flag is set to *True* in `gcm.def` (this parameter also controls the application of a second step in the horizontal dissipation).

The tendencies for the upper boundary sponge layer are computed separately in the `top_bound.F` routine, called from `leapfrog.F`. These tendencies are `dutop`, `dvtop` and `dhtop`, in unit/s.

Three parameters may be adjusted in the `gcm.def` file:

- `iflag_top_bound`: selects the affected layers.
 - 1: only the top 4 layers are affected. In this case, the damping rate is divided by 2 in the second layer, 4 in the third and 8 in the fourth.
 - 2: layers with pressure lower than 100 times the top pressure. In this case, the damping rate depends linearly on the pressure.
- `mode_top_bound`: selects how the fields are affected.
 - 0: No sponge layer is applied.
 - 1: Zonal and meridional winds are damped to zero.
 - 2: Zonal and meridional winds are damped to their zonally averaged value.
 - 3: Temperature, zonal and meridional winds are damped to their zonally averaged value.
- `tau_top_bound`: damping rate (in /s) in the top layer.