INTERPB

Dave Gill
gill@ucar.edu

11.1 Purpose

Generally performs σ to pressure interpolations
- REGRID input
  - FILE_MMOUTP:YYYY-MM-DD_HH
  - For projection change
- r / RAWINS, INTERPF (bare bones) input
  - REGRID_DOMAIN*n*
  - For re-analysis or directly back into INTERPF
- Interpolated model output (all variables)
  - MMOUTP_DOMAIN*n*
 - For user-level diagnostics
  - GRAPH, INTERPF, little_r

NCAR M³

11.2 Procedure

1. Input data from σ-level source
2. Diagnose 3d fields: pressure, RH, Z
3. Diagnose 2d fields: Psfc, SLP, lat/lon
4. Extrapolate above top σ to ptop, and below ground (options in ./hidden/namelist.input)
5. Interpolate to chosen p-levels (options in hidden namelist)
6. Output p-level data in two formats: MM5v3 and intermediate

NCAR M³

11.2 Purpose
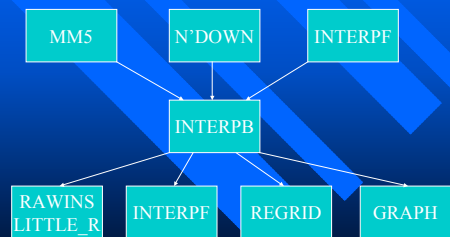
NCAR M³

11.3 Sea Level Pressure Computation

The computations are nearly the inverse of the SLP to Psfc diagnostic in INTERPF.

1. Find surrounding s-levels 100 hPa above surface, compute T_{100_up}
2. Compute $T_{surface}$ and T_{mean}, then Z 100 hPa up, then T_{slv} with standard lapse rate
3. Pslv using same eqn from INTERPF (head to interpf if they look suspicious)

NCAR M³

11.4 Vertical Interpolation/Extrapolation

Because of the definition of σ as normalized between the ground surface and the model top pressure, the half σ−levels never require extrapolation. To compute the pressure levels from σ data ALWAYS require extrapolation.

From namelist options, users choose interpolation and extrapolation options (hidden, accept the defaults, PLEASE)

NCAR M³

11.6 FORTRAN Namelist Input File

RECORD0
- INPUT_FILE – CHARACTER string, file name + optional directory structure for input σ-level data

11.6 FORTRAN Namelist Input File

RECORD1
- start_year: 4-digit integer
- start_month: 2-digit month (01 to 12)
- start_day: 2-digit day (01 to 31)
- start_hour: 2-digit Zulu hour (00 to 23)
- interval: integer time in seconds between analysis periods

11.6 FORTRAN Namelist Input File

RECORD2
- pressure_bu_no_sfc_Pa – array of real, pressure in Pa (NO SFC), from the bottom-up – be careful how you choose ptop
- No surface means the first level is 100000 Pa, the last level is typically PTOP (in Pa), the flag value 100100 should never appear

11.6 FORTRAN Namelist Input File

RECORD3
- print_info – logical, T=turn on lots of print out that would normally be boring

11.6 FORTRAN Namelist Input File - hidden

RECORD4
- uv_interp_method   = 'linear in p   '
- t_interp_method   = 'linear in log p   '
- moist_interp_method   = 'linear in p   '
- height_interp_method = 'linear in log p   '
- p_interp_method   = 'linear in p   '
- else_interp_method   = 'linear in p   '

11.6 FORTRAN Namelist Input File - hidden

RECORD4
- uv_extrap_up   = 'constant   '
- t_extrap_up   = 'constant   '
- moist_extrap_up   = 'constant   '
- height_extrap_up   = 'extrapolate   '
- p_extrap_up   = 'extrapolate   '
- else_extrap_up   = 'constant   '

11.6 FORTRAN Namelist Input File - hidden

RECORD4
- uv_extrap_low = 'constant '
- t_extrap_low = 'extrapolate '
- moist_extrap_low = 'constant '
- height_extrap_low = 'extrapolate '
- p_extrap_low = 'extrapolate '
- else_extrap_low = 'constant '

NCAR M³

11.7 How to Run INTERPB

1. You need an input σ-level data set
2. Get the source code from the mesouser anonymous ftp site:
   ftp://ftp.ucar.edu/mesouser/MM5V3/INTERPB.TAR.gz
3. gunzip and untar the file, type "make" on the supported architectures …
4. … and you're ready to go with "interpb"

NCAR M³