

## User guide for NCLscripts

- *timeseries.ncl* draws NCL line plots of time series with netCDF data produced by PALM
- prompt to run the script:

```
ncl timeseries.ncl [parameter_value=value] ['parameter_string="string" ']
```

- *profiles.ncl* draws NCL line plots of profiles with netCDF data produced by PALM
- prompt to run the script:

```
ncl profiles.ncl [parameter_value=value] ['parameter_string="string" ']
```

- *cross\_sections.ncl* draws NCL contour plots, isoline plots or vector plots (of a 2-dimensional vector) from two-dimensional cross-sections of NetCDF data produced by PALM; instantaneous or time-averaged xy-, xz-, yz- or 3D-data can be used
- possibility of overlaying different plot types
- by default, all time steps, variables and layers in the netCDF data file will be drawn
- prompt to run the script:

```
ncl cross_sections.ncl [parameter_value=value] ['parameter_string="string" ']
```

- parameter list:

parameter_value/ 'parameter_string'		used by	default	meaning
'file_in'	required	all		netcdf file for input [e.g. "path/name.nc"]
'format_out'	optional	all	"x11"	format of output file [NCGM file ("ncgm"), PostScript file ("ps", "eps", or "epsi"), PDF file ("pdf") or X11 window ("x11")]
'file_out'	optional	all	"test"	name and location for output file [e.g. "path/name"]
start_time_step	optional	all	1 (first time step of input file)	first time step of plot
end_time_step	optional	all	last time step of input file	last time step of plot
no_columns	optional	all	1	number of plots in one row
no_lines	optional	all	2	number of plots in one column
'var'	optional	all	all variables will be plotted	name of variables that shall be plotted [e.g. ",ws2,pt,"]; please be sure to have one comma before and after every variable name (also before the first and after the last one!)
combine	optional	profile	0	plot with more than one variable will be switched on [1] or off [0]

parameter_value/ 'parameter_string'		used by	default	meaning
number_comb	required if combine =1	profile	0	number of variables that shall be plotted together in one plot
'c_var'	required if combine =1	profile		name of variables that shall be plotted together in one plot [e.g. “,umax,vmax,”]; please be sure to have one comma before and after every variable name (also before the first and after the last one!)
dash	optional	profile	0	use of different line patterns [1] or continuous lines for all time steps [0]
black	optional	profile	0	colored [0] or black and white [1] plots
min_z	optional	profile	0	minimum height of profiles
max_z	optional	profile	maximum height	maximum height of profiles
'sort'	optional	cross	“time”	defines the sequence of plots; either by time step [“time”] or by layer [“layer”]
'mode'	optional	cross	“Fill”	contour plots [“Fill”], isoline plots [“Line”] or b oth [“Both”] will be drawn
'fill_mode'	optional	cross	“AreaFill”	Style of filling the contour plots [“AreaFill”],[“RasterFill”] or [“CellFill”]
shape	optional	cross	1	aspect ratio of axis will be kept [1] or not [0]
xyz	required [one (only one!) of these parameters must be set to 1 ]	cross	0	output of xy-cross sections will be switched on [1] or off [0]
xzc		cross	0	output of xz-cross sections will be switched on [1] or off [0]
yzc		cross	0	output of yz-cross sections will be switched on [1] or off [0]
xs	optional	cross	0	index of range start for x-coordinate
xe	optional	cross	dimension size -1	index of range end for x-coordinate
ys	optional	cross	0	index of range start for y-coordinate
ye	optional	cross	dimension size -1	index of range end for y-coordinate
zs	optional	cross	0	index of range start for z-coordinate
ze	optional	cross	dimension size -1	index of range end for z-coordinate

parameter_value/ 'parameter_string'		used by	default	meaning
vector	optional	cross	0	vector plot will be switched on [1] or off [0]
'vec1'	required if vector = 1	cross	"vec1"	name of variable for first component of vector for vector plot [e.g. ",u,"]; please be sure to have one comma before and after every variable name (also before the first and after the last one!)
'vec2'	required if vector = 1	cross	"vec2"	name of variable for second component of vector for vector plot [e.g. ",v,"]; please be sure to have one comma before and after every variable name (also before the first and after the last one!)
'plotvec'	optional	cross	"plotvec"	variables where a vector plot shall overlay [e.g. ",u,v,"]; please be sure to have one comma before and after every variable name (also before the first and after the last one!)
ref_mag	optional	cross	0.05	value of referenced vector with defined length [can be seen in legend]
over	optional	time & profile	0	defined overlaying of the standard variables will be switched on [1] or off [0]

- instead of running the prompt with all parameters they can be written into the ascii file *.ncl\_preferences* which will be read by the script; values/strings given in the prompt overwrite the list values/strings
- *.ncl\_preferences* runs for all three scripts, so some parameters will be ignored by the scripts and you don't need to consider them
- please be sure to copy the list from the subversion directory into your \$home directory
- please check your strings and values in *.ncl\_preferences* for correctness if the program aborts (it should not abort, if you use the original list with the default values); small differences may let abort the program (e.g. there must not be any blanks after the parameter strings); please be sure not to swap any rows in *.ncl\_preferences*

Examples for *timeseries.ncl*:

1. minimal required prompt to get time serieses of all variables in the data file:  
`ncl timeseries.ncl 'file_in=~/.example_ts.nc'`
2. time serieses of all variables in the data file with four plots on one sheet and output to \$home/time\_out.pdf:  
`ncl timeseries.ncl 'file_in=~/.example_ts.nc' 'format_out="pdf"' 'file_out=~/.time_out' 'no_columns=2 no_lines=2'`

Examples for *profiles.ncl*:

3. minimal required prompt to get profiles of all variables in the data file:  
`ncl profiles.ncl 'file_in=~/.example_pr.nc'`
4. one combined plot of two variables (pt, wpt):  
`ncl profiles.ncl 'file_in=~/.example_pr.nc' 'var="pt,wpt"' 'combine=1 number_comb=2 'c_var="pt,wpt'`

Examples for *cross\_sections.ncl*:

5. minimal required prompt to get cross sections of all variables in the data file for one cross section (xy in this example):  
`ncl cross_sections.ncl 'file_in=~/.example_3d_av.nc' xyc=1`
6. three vector plots of all variables in the data file; yz-cross section of all layers from time step 1 to 3 in one column  
`ncl cross_sections.ncl 'file_in=~/.example_3d_av.nc' yzc=1 vector=1 'vec1="v"' 'vec2="w"' 'start_time_step=1 end_time_step=3 no_columns=1 no_lines=3`
7. contour with isoline plots of all variables in the data file sorted by layer (xy cross section); vector plots will be overlaid on variable u:  
`ncl cross_sections.ncl 'file_in=~/.example_3d_av.nc' xyc=1 'mode="Both"' vector=1 'vec1="u"' 'vec2="v"' 'plotvec="u"' 'sort="layer'`