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 (string)	all		netcdf file for input; [e.g. "path/name.nc"]
'format_out'	optional (string)	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 (string)	all	"test"	name and location for output file; [e.g. "path/name"]
start_time_step	optional (dfloat)	all	first time step of input file	first time step of plot [s]; you don't have to indicate a precise time value of the input file, your input value will be rounded if not exactly existent on the input file
end_time_step	optional (dfloat)	all	last time step of input file	last time step of plot [s]; you don't have to indicate a precise time value of the input file, your input value will be rounded if not exactly existent on the input file
no_columns	optional (integer)	all	1	number of plots in one row
no_lines	optional (integer)	all	2	number of plots in one column
'var'	optional (string)	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 (integer)	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 (integer)	profile		number of variables that shall be plotted together in one plot
'c_var'	required if combine =1 (string)	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 (integer)	profile	0	use of different line patterns [1] or continuous lines for all time steps [0]
black	optional (integer)	profile	0	colored [0] or black and white [1] plots
min_z	optional (integer)	profile	minimum height of input file	minimum height of profiles
max_z	optional (integer)	profile	maximum height of input file	maximum height of profiles
over	optional (integer)	time & profile	0	defined overlaying of the standard variables will be switched on [1] or off [0]
vector	optional (integer)	cross	0	vector plots for one vector will be switched on [1] or off [0]; (vector components defined with 'vec1' and 'vec2')
'vec1'	required if vector = 1 (string)	cross		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 (string)	cross		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 (string)	cross		variables where a vector plot shall overlay; [e.g. ",u,v,"] if desired; 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 (float)	cross	0.05	value of referenced vector with defined length [can be seen in legend]
'mode'	optional (string)	cross	"Fill"	contour plots ["Fill"], isoline plots ["Line"] or both ["Both"] will be drawn
'sort'	optional	cross	"time"	defines the sequence of plots; either by time step ["time"] or by layer ["layer"]
'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]

parameter_value/ 'parameter_string'		used by	default	meaning
xyc	required [one (only one!) of these parameters must be set to 1] (integer)	cross	0	ouput of xy-cross sections will be switched on [1] or off [0]
xzc		cross	0	ouput of xz-cross sections will be switched on [1] or off [0]
yzc		cross	0	ouput of yz-cross sections will be switched on [1] or off [0]
xs	optional (cross: dfloat profile: float)	cross & profile	first x value of input file	**cross**:start value of x-coordinate [m]; you don't have to indicate a precise x value of the input file, your input value xs will be rounded if not existent on the input file
				profile: minimum of x-range [dimension of input varaible]
xe	optional (cross: dfloat profile: float)	cross & profile	last x value of input file	**cross**: end value of x-coordinate [m]; you don't have to indicate a precise x value of the input file, your input value xe will be rounded if not existent on the input file
				profile: maximum of x-range [dimension of input varaible]
ys	optional (dfloat)	cross	first y value of input file	start value of y-coordinate [m]; you don't have to indicate a precise y value of the input file, your input value ys will be rounded if not exactly existent on the input file
ye	optional (dfloat)	cross	last x value of input file	end value of y-coordinate [m]; you don't have to indicate a precise y value of the input file, your input value ye will be rounded if not exactly existent on the input file
zs	optional (integer)	cross	first index of input file	first index of z-coordinate; due to grid stretching you have to indicate an index instead of meters
ze	optional (integer)	cross	last index of input file	last index for z-coordinate; due to grid stretching you have to indicate an index instead of meters

- 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 overlayed 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"'