CDO Reference Card

Climate Data Operators
Version 0.9.13
May 2006

Uwe Schulzweida
Max-Planck-Institute for Meteorology

Syntax

cdo [Options] **Operators**

Options

-a	Convert from relative to absolute time axis
-f <*format*>	Output file format (grb, nc, nc2, srv, ext, ieg)
-g <*grid*>	Grid name or file Available grids: t<RES>grid, r<NX>x<NY>
-h	Help information for the operators
-m <*missval*>	Set the default missing value (default: `-9e+33`)
-p <*prec*>	Set the precision of the output data in bytes (4/8 for nc, nc2, srv, ext; 1/2/3 for grb)
-R	Convert GRIB data from reduced to regular grid
-r	Convert from absolute to relative time axis
-t <*table*>	Set the parameter table name or file Predefined tables: echam4 echam5 mpiom1
-V	Print the version number
-v	Print extra details for some operators

Operators

Information

info	Dataset information
map	Dataset information and simple map
Syntax	<*operator*> `ifiles`

sinfo	Short dataset information
Syntax	<*operator*> `ifile`

diff	Compare two datasets
Syntax	<*operator*> `ifile1 ifile2`

ncode	Number of codes
nvar	Number of variables
nlevel	Number of levels
nyear	Number of years
nmon	Number of months
ndate	Number of dates
ntime	Number of time steps
Syntax	<*operator*> `ifile`

showcode	Show codes
showvar	Show variable names
showlevel	Show levels
showyear	Show years
showmon	Show months
showdate	Show dates
showtime	Show time steps
Syntax	<*operator*> `ifile`

vardes	Variable description
griddes	Grid description
vct	Vertical coordinate table
Syntax	<*operator*> `ifile`

File operations

copy	Copy datasets
cat	Concatenate datasets
Syntax	<*operator*> `ifiles ofile`

replace	Replace variables
Syntax	**replace** `ifile1 ifile2 ofile`

merge	Merge datasets with different fields
mergetime	Merge datasets sorted by date and time
Syntax	<*operator*> `ifiles ofile`

splitcode	Split codes
splitvar	Split variables
splitlevel	Split levels
splitgrid	Split grids
splitzaxis	Split zaxis
splitrec	Split records
Syntax	<*operator*> `ifile oprefix`

splithour	Split hours
splitday	Split days
splitmon	Split months
splitseas	Split seasons
splityear	Split years
Syntax	<*operator*> `ifile oprefix`

Selection

selcode	Select codes
delcode	Delete codes
Syntax	<*operator*>,*codes* `ifile ofile`

selvar	Select variables
delvar	Delete variables
Syntax	<*operator*>,*vars* `ifile ofile`

sellevel	Select levels
Syntax	**sellevel**,*levels* `ifile ofile`

selgrid	Select grids
Syntax	**selgrid**,*grids* `ifile ofile`

selgridname	Select grid by name
Syntax	**selgridname**,*gridnames* `ifile ofile`

selzaxis	Select zaxis
Syntax	**selzaxis**,*zaxis* `ifile ofile`

selzaxisname	Select zaxis by name
Syntax	**selzaxisname**,*zaxisnames* `ifile ofile`

seltabnum	Select parameter table number
Syntax	**seltabnum**,*tabnum* `ifile ofile`

selrec	Select records
Syntax	**selrec**,*records* `ifile ofile`

seltimestep	Select time steps
Syntax	**seltimestep**,*timesteps* `ifile ofile`

seltime	Select times
Syntax	**seltime**,*times* `ifile ofile`

selhour	Select hours
Syntax	**selhour**,*hours* `ifile ofile`

selday	Select days
Syntax	**selday**,*days* `ifile ofile`

selmon	Select months
Syntax	**selmon**,*months* `ifile ofile`

selyear	Select years
Syntax	**selyear**,*years* `ifile ofile`

selseas	Select seasons
Syntax	**selseas**,*seasons* `ifile ofile`

seldate	Select dates
Syntax	**seldate**,*date1[,date2]* `ifile ofile`

sellonlatbox	Select lon/lat box
Syntax	**sellonlatbox**,*lon1,lon2,lat1,lat2* `ifile ofile`

selindexbox	Select index box
Syntax	**selindexbox**,*idx1,idx2,idy1,idy2* `ifile ofile`

Modification

setpartab	Set parameter table
Syntax	**setpartab**,*table* `ifile ofile`

setcode	Set code number
Syntax	**setcode**,*code* `ifile ofile`

setvar	Set variable name
Syntax	**setvar**,*name* `ifile ofile`

setlevel	Set level
Syntax	**setlevel**,*level* `ifile ofile`

setdate	Set date
Syntax	**setdate**,*date* `ifile ofile`

settime	Set time
Syntax	**settime**,*time* `ifile ofile`

setday	Set day
Syntax	**setday**,*day* `ifile ofile`

setmon	Set month
Syntax	**setmon**,*month* `ifile ofile`

setyear	Set year
Syntax	**setyear**,*year* `ifile ofile`

settunits	Set time units
Syntax	**settunits**,*units* `ifile ofile`

settaxis	Set time axis
Syntax	**settaxis**,*date,time[,inc]* `ifile ofile`

setreftime	Set reference time
Syntax	**setreftime**,*date,time* `ifile ofile`

setcalendar	Set calendar
Syntax	**setcalendar**,*calendar* `ifile ofile`

shifttime	Shift time steps
Syntax	**shifttime**,*sval* `ifile ofile`

chcode	Change code number
Syntax	**chcode**,*oldcode,newcode[,...]* `ifile ofile`

chvar	Change variable name
Syntax	**chvar**,*ovar,nvar,...* `ifile ofile`

chlevel	Change level
Syntax	**chlevel**,*oldlev,newlev,...* `ifile ofile`

chlevelc	Change level of one code
Syntax	**chlevelc**,*code,oldlev,newlev* `ifile ofile`

chlevelv	Change level of one variable
Syntax	**chlevelv**,*var,oldlev,newlev* `ifile ofile`

setgrid	Set grid
Syntax	**setgrid**,*grid* `ifile ofile`

setgridtype	Set grid type
Syntax	**setgridtype**,*gridtype* `ifile ofile`

setzaxis	Set zaxis
Syntax	**setzaxis**,*zaxis* `ifile ofile`

setgatt	Set global attribute
Syntax	**setgatt**,*attname,attstring* `ifile ofile`

setgatts	Set global attributes
Syntax	**setgatts**,*attfile* `ifile ofile`

invertlat	Invert latitude
invertlon	Invert longitude
invertlatdes	Invert latitude description
invertlondes	Invert longitude description
invertlatdata	Invert latitude data
invertlondata	Invert longitude data
Syntax	<*operator*> `ifile ofile`

masklonlatbox	Mask lon/lat box
Syntax	**masklonlatbox**,*lon1,lon2,lat1,lat2* `ifile ofile`
maskindexbox	Mask index box
Syntax	**maskindexbox**,*idx1,idx2,idy1,idy2* `ifile ofile`

enlarge	Enlarge fields
Syntax	**enlarge**,*grid* `ifile ofile`

setmissval	Set a new missing value
Syntax	**setmissval**,*miss* `ifile ofile`
setctomiss	Set constant to missing value
setmisstoc	Set missing value to constant
Syntax	<*operator*>,*c* `ifile ofile`
setrtomiss	Set range to missing value
Syntax	**setrtomiss**,*rmin,rmax* `ifile ofile`

Arithmetic

expr	Evaluate expressions
Syntax	**expr**,*instr* `ifile ofile`
exprf	Evaluate expressions from script file
Syntax	**exprf**,*filename* `ifile ofile`

abs	Absolute value
sqr	Square
sqrt	Square root
exp	Exponential
ln	Natural logarithm
log10	Base 10 logarithm
sin	Sine
cos	Cosine
tan	Tangent
asin	Arc sine
acos	Arc cosine
atan	Arc tangent
Syntax	<*operator*> `ifile ofile`

addc	Add a constant
subc	Subtract a constant
mulc	Multiply with a constant
divc	Divide by a constant
Syntax	<*operator*>,*c* `ifile ofile`

add	Add two fields
sub	Subtract two fields
mul	Multiply two fields
div	Divide two fields
min	Minimum of two fields
max	Maximum of two fields
atan2	Arc tangent of two fields
Syntax	<*operator*> `ifile1 ifile2 ofile`

ymonadd	Add multi-year monthly time averages
ymonsub	Subtract multi-year monthly time averages
ymonmul	Multiply multi-year monthly time averages
ymondiv	Divide multi-year monthly time averages
Syntax	<*operator*> `ifile1 ifile2 ofile`

muldpm	Multiply with days per month
divdpm	Divide by days per month
muldpy	Multiply with days per year
divdpy	Divide by days per year
Syntax	<*operator*> `ifile ofile`

Comparison

eq	Equal
ne	Not equal
le	Less equal
lt	Less than
ge	Greater equal
gt	Greater than
Syntax	<*operator*> `ifile1 ifile2 ofile`

eqc	Equal constant
nec	Not equal constant
lec	Less equal constant
ltc	Less then constant
gec	Greater equal constant
gtc	Greater then constant
Syntax	<*operator*>,*c* `ifile ofile`

Condition

ifthen	If then
ifnotthen	If not then
Syntax	<*operator*> `ifile1 ifile2 ofile`

ifthenelse	If then else
Syntax	**ifthenelse** `ifile1 ifile2 ifile3 ofile`

ifthenc	If then constant
ifnotthenc	If not then constant
Syntax	<*operator*>,*c* `ifile ofile`

Statistical values

ensmin	Ensemble minimum
ensmax	Ensemble maximum
enssum	Ensemble sum
ensmean	Ensemble mean
ensavg	Ensemble average
ensstd	Ensemble standard deviation
ensvar	Ensemble variance
Syntax	*<operator>* `ifiles ofile`

fldmin	Field minimum
fldmax	Field maximum
fldsum	Field sum
fldmean	Field mean
fldavg	Field average
fldstd	Field standard deviation
fldvar	Field variance
Syntax	*<operator>* `ifile ofile`

zonmin	Zonal minimum
zonmax	Zonal maximum
zonsum	Zonal sum
zonmean	Zonal mean
zonavg	Zonal average
zonstd	Zonal standard deviation
zonvar	Zonal variance
Syntax	*<operator>* `ifile ofile`

mermin	Meridional minimum
mermax	Meridional maximum
mersum	Meridional sum
mermean	Meridional mean
meravg	Meridional average
merstd	Meridional standard deviation
mervar	Meridional variance
Syntax	*<operator>* `ifile ofile`

vertmin	Vertical minimum
vertmax	Vertical maximum
vertsum	Vertical sum
vertmean	Vertical mean
vertavg	Vertical average
vertstd	Vertical standard deviation
Syntax	*<operator>* `ifile ofile`

selmin	Time range minimum
selmax	Time range maximum
selsum	Time range sum
selmean	Time range mean
selavg	Time range average
selstd	Time range standard deviation
Syntax	*<operator>,nsets[,noffset[,nskip]]* `ifile ofile`

runmin	Running minimum
runmax	Running maximum
runsum	Running sum
runmean	Running mean
runavg	Running average
runstd	Running standard deviation
Syntax	*<operator>,nts* `ifile ofile`

timmin	Time minimum
timmax	Time maximum
timsum	Time sum
timmean	Time mean
timavg	Time average
timstd	Time standard deviation
Syntax	*<operator>* `ifile ofile`

hourmin	Hourly minimum
hourmax	Hourly maximum
hoursum	Hourly sum
hourmean	Hourly mean
houravg	Hourly average
hourstd	Hourly standard deviation
Syntax	*<operator>* `ifile ofile`

daymin	Daily minimum
daymax	Daily maximum
daysum	Daily sum
daymean	Daily mean
dayavg	Daily average
daystd	Daily standard deviation
Syntax	*<operator>* `ifile ofile`

monmin	Monthly minimum
monmax	Monthly maximum
monsum	Monthly sum
monmean	Monthly mean
monavg	Monthly average
monstd	Monthly standard deviation
Syntax	*<operator>* `ifile ofile`

yearmin	Yearly minimum
yearmax	Yearly maximum
yearsum	Yearly sum
yearmean	Yearly mean
yearavg	Yearly average
yearstd	Yearly standard deviation
Syntax	*<operator>* `ifile ofile`

seasmin	Seasonally minimum
seasmax	Seasonally maximum
seassum	Seasonally sum
seasmean	Seasonally mean
seasavg	Seasonally average
seasstd	Seasonally standard deviation
Syntax	*<operator>* `ifile ofile`

ydaymin	Multi-year daily minimum
ydaymax	Multi-year daily maximum
ydaymean	Multi-year daily mean
ydayavg	Multi-year daily average
ydaystd	Multi-year daily standard deviation
Syntax	*<operator>* `ifile ofile`

ymonmin	Multi-year monthly minimum
ymonmax	Multi-year monthly maximum
ymonmean	Multi-year monthly mean
ymonavg	Multi-year monthly average
ymonstd	Multi-year monthly standard deviation
Syntax	*<operator>* `ifile ofile`

yseasmin	Multi-year seasonally minimum
yseasmax	Multi-year seasonally maximum
yseasmean	Multi-year seasonally mean
yseasavg	Multi-year seasonally average
yseasstd	Multi-year seasonally standard deviation
Syntax	*<operator>* `ifile ofile`

Regression

detrend	Detrend
Syntax	**detrend** `ifile ofile`

trend	Trend
Syntax	**trend** `ifile ofile1 ofile2`

subtrend	Subtract trend
Syntax	**subtrend** `ifile1 ifile2 ifile3 ofile`

Interpolation

remapbil	Bilinear interpolation
remapbic	Bicubic interpolation
remapcon	Conservative remapping
remapdis	Distance-weighted averaging
Syntax	*<operator>,grid* `ifile ofile`

genbil	Generate bilinear interpolation weights
genbic	Generate bicubic interpolation weights
gencon	Generate conservative interpolation weights
gendis	Generate distance-weighted averaging weights
Syntax	*<operator>,grid* `ifile ofile`

remap	SCRIP grid remapping
Syntax	**remap**,*grid,weights* `ifile ofile`

interpolate	PINGO grid interpolation
intgridbil	Bilinear grid interpolation
Syntax	*<operator>,grid* `ifile ofile`

ml2pl	Model to pressure level interpolation
Syntax	**ml2pl**,*plevels* `ifile ofile`

ml2hl	Model to height level interpolation
Syntax	**ml2hl**,*hlevels* `ifile ofile`

inttime	Time interpolation
Syntax	**inttime**,*date,time[,inc]* `ifile ofile`

intyear	Year interpolation
Syntax	**intyear**,*years* `ifile1 ifile2 oprefix`

Transformation

sp2gp	Spectral to gridpoint
sp2gpl	Spectral to gridpoint linear
gp2sp	Gridpoint to spectral
gp2spl	Gridpoint to spectral linear
Syntax	*<operator>* `ifile ofile`

sp2sp	Spectral to spectral
Syntax	**sp2sp**,*trunc* `ifile ofile`

uv2dv	U and V wind to divergence and vorticity
dv2uv	Divergence and vorticity to U and V wind
Syntax	*<operator>* `ifile ofile`

Formatted I/O

input	ASCII input
Syntax	**input**,*grid* `ofile`

inputsrv	SERVICE input
inputext	EXTRA input
Syntax	*<operator>* `ofile`

output	ASCII output
Syntax	**output** `ifiles`

outputf	Formatted output
Syntax	**outputf**,*format,nelem* `ifiles`

outputint	Integer output
outputsrv	SERVICE output
outputext	EXTRA output
Syntax	*<operator>* `ifiles`

Miscellaneous

timsort	Sort over the time
Syntax	**timsort** `ifile ofile`

const	Create a constant field
Syntax	**const**,*const,grid* `ofile`

random	Create field with random values
Syntax	**random**,*grid* `ofile`

vardup	Duplicate variables
Syntax	**vardup** `ifile ofile`

varmul	Multiply variables
Syntax	**varmul**,*nmul* `ifile ofile`

gradsdes	GrADS data descriptor file
gradsdes2	GrADS data descriptor file (version 2 map)
Syntax	*<operator>* `ifile`

rotuvb	Backward rotation
Syntax	**rotuvb**,*u,v,...* `ifile ofile`

mastrfu	Mass stream function
Syntax	**mastrfu** `ifile ofile`