CDO Reference Card

Climate Data Operators
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Syntax

cdo [Options] Operators

Options

-a	Convert from a relative to an absolute time axis
-b <*nbits*>	Set the number of bits for the output precision (32/64 for nc, nc2, srv, ext, ieg; 1 - 32 for grb)
-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`)
-R	Convert GRIB data from reduced to regular grid
-r	Convert from an absolute to a 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 listed by code number
infov	Dataset information listed by variable name
map	Dataset information and simple map
Syntax	<*operator*> `ifiles`

sinfo	Short dataset information listed by code number
sinfov	Short dataset information listed by variable name
Syntax	<*operator*> `ifile`

diff	Compare two datasets listed by code number
diffv	Compare two datasets listed by variable name
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`

showformat	Show file format
showcode	Show codes
showvar	Show variable names
showstdname	Show standard 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`
selstdname	Select standard names
Syntax	**selstdname**,*stdnames* `ifile ofile`
sellevel	Select levels
Syntax	**sellevel**,*levels* `ifile ofile`
selgrid	Select grids
Syntax	**selgrid**,*grids* `ifile ofile`
selgridname	Select grids by name
Syntax	**selgridname**,*gridnames* `ifile ofile`
selzaxis	Select zaxes
Syntax	**selzaxis**,*zaxes* `ifile ofile`
selzaxisname	Select zaxes by name
Syntax	**selzaxisname**,*zaxisnames* `ifile ofile`
seltabnum	Select parameter table numbers
Syntax	**seltabnum**,*tabnums* `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 a longitude/latitude box
Syntax	**sellonlatbox**,*lon1,lon2,lat1,lat2* `ifile ofile`
selindexbox	Select an index box
Syntax	**selindexbox**,*idx1,idx2,idy1,idy2* `ifile ofile`

Conditional selection

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`

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`

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 a longitude/latitude box
Syntax	**masklonlatbox**,*lon1,lon2,lat1,lat2* `ifile ofile`
maskindexbox	Mask an index box
Syntax	**maskindexbox**,*idx1,idx2,idy1,idy2* `ifile ofile`

setclonlatbox	Set a longitude/latitude box to constant
Syntax	**setclonlatbox**,*c,lon1,lon2,lat1,lat2* `ifile ofile`
setcindexbox	Set an index box to constant
Syntax	**setcindexbox**,*c,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
int	Integer value
nint	Nearest integer 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 average
ymonsub	Subtract multi-year monthly time average
ymonmul	Multiply multi-year monthly time average
ymondiv	Divide multi-year monthly time average
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`

Statistical values

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

enspctl	Ensemble percentiles
Syntax	**enspctl**,*p* `ifiles ofile`

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

fldpctl	Field percentiles
Syntax	**fldpctl**,*p* `ifile ofile`

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

zonpctl	Zonal percentiles
Syntax	**zonpctl**,*p* `ifile ofile`

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

merpctl	Meridional percentiles
Syntax	**merpctl**,*p* `ifile ofile`

vertmin	Vertical minimum
vertmax	Vertical maximum
vertsum	Vertical sum
vertmean	Vertical mean
vertavg	Vertical average
vertvar	Vertical variance
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
selvar	Time range variance
selstd	Time range standard deviation
Syntax	<*operator*>,*nsets[,noffset[,nskip]]* `ifile ofile`

selpctl	Time range percentiles
Syntax	**selpctl**,*p*,*nsets[,noffset[,nskip]]* `in1 in2 in3 out`

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

runpctl	Running percentiles
Syntax	**runpctl**,*p*,*nts* `ifile1 ofile`

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

timpctl	Time percentiles
Syntax	**timpctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

hourpctl	Hourly percentiles
Syntax	**hourpctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

daypctl	Daily percentiles
Syntax	**daypctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

monpctl	Monthly percentiles
Syntax	**monpctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

yearpctl	Yearly percentiles
Syntax	**yearpctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

seaspctl	Seasonal percentiles
Syntax	**seaspctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

ydaypctl	Multi-year daily percentiles
Syntax	**ydaypctl**,*p* `ifile1 ifile2 ifile3 ofile`

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

ymonpctl	Multi-year monthly percentiles
Syntax	**ymonpctl**,*p* `ifile1 ifile2 ifile3 ofile`

yseasmin	Multi-year seasonal minimum
yseasmax	Multi-year seasonal maximum
yseassum	Multi-year seasonal sum
yseasmean	Multi-year seasonal mean
yseasavg	Multi-year seasonal average
yseasvar	Multi-year seasonal variance
yseasstd	Multi-year seasonal standard deviation
Syntax	<*operator*> `ifile ofile`

yseaspctl	Multi-year seasonal percentiles
Syntax	**yseaspctl**,*p* `ifile1 ifile2 ifile3 ofile`

ydrunmin	Multi-year daily running minimum
ydrunmax	Multi-year daily running maximum
ydrunsum	Multi-year daily running sum
ydrunmean	Multi-year daily running mean
ydrunavg	Multi-year daily running average
ydrunvar	Multi-year daily running variance
ydrunstd	Multi-year daily running standard deviation
Syntax	<*operator*>,*nts* `ifile ofile`

ydrunpctl	Multi-year daily running percentiles
Syntax	**ydrunpctl**,*p*,*nts* `ifile1 ifile2 ifile3 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`

intntime	Time interpolation
Syntax	**intntime**,*n* `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

gradsdes1	GrADS data descriptor file (version 1 GRIB map)
gradsdes2	GrADS data descriptor file (version 2 GRIB map)
Syntax	<*operator*> `ifile`

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

const	Create a constant field
Syntax	**const**,*const*,*grid* `ofile`
random	Create a field with random values
Syntax	**random**,*grid* `ofile`

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

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

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

hi	Humidity index
Syntax	**hi** `ifile1 ifile2 ifile3 ofile`

tchill	Windchill temperature
Syntax	**tchill** `ifile1 ifile2 ofile`

ECA indices

eca_cdd	Consecutive dry days
Syntax	**eca_cdd** `ifile ofile`

eca_cfd	Consecutive frost days
Syntax	**eca_cfd** `ifile ofile`

eca_csu	Consecutive summer days
Syntax	**eca_csu***[,T]* `ifile ofile`

eca_cwd	Consecutive wet days
Syntax	**eca_cwd** `ifile ofile`

eca_cwdi	Cold wave duration index
Syntax	**eca_cwdi***[,nday[,T]]* `ifile1 ifile2 ofile`

eca_cwfi	Cold-spell days
Syntax	**eca_cwfi***[,nday]* `ifile1 ifile2 ofile`

eca_etr	Intra-period extreme temperature range
Syntax	**eca_etr** `ifile1 ifile2 ofile`

eca_fd	Frost days
Syntax	**eca_fd** `ifile ofile`

eca_fdns	Frost days where no snow
Syntax	**eca_fdns** `ifile1 ifile2 ofile`

eca_gsl	Growing season length
Syntax	**eca_gsl***[,nday[,T]]* `ifile ofile`

eca_hd	Heating degree days
Syntax	**eca_hd***[,T1[,T2]]* `ifile ofile`

eca_hwdi	Heat wave duration index
Syntax	**eca_hwdi***[,nday[,T]]* `ifile1 ifile2 ofile`

eca_hwfi	Warm-spell days
Syntax	**eca_hwfi***[,nday]* `ifile1 ifile2 ofile`

eca_id	Ice days
Syntax	**eca_id** `ifile ofile`

eca_r10mm	Heavy precipitation days
Syntax	**eca_r10mm** `ifile ofile`

eca_r20mm	Very heavy precipitation days
Syntax	**eca_r20mm** `ifile ofile`

eca_r75p	Moderate wet days wrt 75th percentile of reference period
Syntax	**eca_r75p** `ifile1 ifile2 ofile`

eca_r75ptot	Precipitation fraction due to R75p days
Syntax	**eca_r75ptot** `ifile1 ifile2 ofile`

eca_r90p	Very wet days wrt 90th percentile of reference period
Syntax	**eca_r90p** `ifile1 ifile2 ofile`

eca_r90ptot	Precipitation fraction due to R90p days
Syntax	**eca_r90ptot** `ifile1 ifile2 ofile`

eca_r95p	Very wet days wrt 95th percentile of reference period
Syntax	**eca_r95p** `ifile1 ifile2 ofile`

eca_r95ptot	Precipitation fraction due to R95p days
Syntax	**eca_r95ptot** `ifile1 ifile2 ofile`

eca_r99p	Extremely wet days wrt 99th percentile of reference period
Syntax	**eca_r99p** `ifile1 ifile2 ofile`

eca_r99ptot	Precipitation fraction due to R99p days
Syntax	**eca_r99ptot** `ifile1 ifile2 ofile`

eca_rr1	Wet days
Syntax	**eca_rr1** `ifile ofile`

eca_rx1day	Highest one-day precipitation amount
Syntax	**eca_rx1day***[,mode]* `ifile ofile`

eca_rx5day	Highest five-day precipitation amount
Syntax	**eca_rx5day***[,x]* `ifile ofile`

eca_sdii	Simple daily intensity index
Syntax	**eca_sdii** `ifile ofile`

eca_strwind	Strong wind days
Syntax	**eca_strwind***[,bnum]* `ifile ofile`

eca_su	Summer days
Syntax	**eca_su***[,T]* `ifile ofile`

eca_tg10p	Cold days wrt 10th percentile of reference period
Syntax	**eca_tg10p** `ifile1 ifile2 ofile`

eca_tg90p	Warm days wrt 90th percentile of reference period
Syntax	**eca_tg90p** `ifile1 ifile2 ofile`

eca_tn10p	Cold nights wrt 10th percentile of reference period
Syntax	**eca_tn10p** `ifile1 ifile2 ofile`

eca_tn90p	Warm nights wrt 90th percentile of reference period
Syntax	**eca_tn90p** `ifile1 ifile2 ofile`

eca_tr	Tropical nights
Syntax	**eca_tr***[,T]* `ifile ofile`

eca_tx10p	Cold days wrt 10th percentile of reference period
Syntax	**eca_tx10p** `ifile1 ifile2 ofile`

eca_tx90p	Warm days wrt 90th percentile of reference period
Syntax	**eca_tx90p** `ifile1 ifile2 ofile`