

CDO Reference Card

Climate Data Operators
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http://www.mpimet.mpg.de/cdo

Syntax

cdo	[Options]	Operator1	[–Operator2	[–OperatorN]
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Options

-a	Convert from a relative to an absolute time axis
-b <i><nbits></i>	Set the number of bits for output precision (32/64 for nc,nc2,nc4,srv,ext,ieg; 1 - 32 for grb)
-f <i><format></i>	Output file format (grb,nc,nc2,nc4,srv,ext,ieg)
-g <i><grid></i>	Grid name or file Available grids: t<RES>grid, r<NX>x<NY>
-h	Help information for the operators
-m <i><missval></i>	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
-s	Silent mode
-t <i><table></i>	Set the parameter table name or file Predefined tables: echam4 echam5 mpiom1
-V	Print the version number
-v	Print extra details for some operators
-z szip	Compress GRIB records with szip

Operators

Information

info infov map	Dataset information listed by code number Dataset information listed by variable name Dataset information and simple map
Syntax	<operator> ifiles
sinfo sinfov	Short dataset information listed by code number Short dataset information listed by variable name
Syntax	<operator> ifiles
diff diffv	Compare two datasets listed by code number Compare two datasets listed by variable name
Syntax	<operator> ifile1 ifile2
npar nlevel nyear nmon ndate ntime	Number of parameters Number of levels Number of years Number of months Number of dates Number of time steps
Syntax	<operator> ifile
showformat showcode showname showstdname showlevel showtype showyear showmon showdate showtime	Show file format Show code numbers Show variable names Show standard names Show levels Show GRIB level types Show years Show months Show dates Show time steps
Syntax	<operator> ifile

pardes griddes zaxisdes vct	Parameter description Grid description Z-axis description Vertical coordinate table
Syntax	<operator> ifile

File operations

copy cat	Copy datasets Concatenate datasets
Syntax	<operator> ifiles ofile
replace	Replace variables
Syntax	replace ifile1 ifile2 ofile
merge mergetime	Merge datasets with different fields Merge datasets sorted by date and time
Syntax	<operator> ifiles ofile
splitcode splitname splitlevel splitgrid splitzaxis	Split code numbers Split variable names Split levels Split grids Split z-axes
Syntax	<operator> ifile oprefix
splithour splitday splitmon splitseas splityear	Split hours Split days Split months Split seasons Split years
Syntax	<operator> ifile oprefix
splitsel	Split time selection
Syntax	splitsel,nsets[,noffset[,nskip]] ifile oprefix

Selection

selcode delcode	Select variables by code number Delete variables by code number
Syntax	<operator>,codes ifile ofile
selname delname	Select variables by name Delete variables by name
Syntax	<operator>,varnames ifile ofile
selstdname	Select variables by standard name
Syntax	selstdname,stdnames ifile ofile
sellevel	Select levels
Syntax	sellevel,levels ifile ofile
sellevidx	Select levels by index
Syntax	sellevidx,levidx ifile ofile
selgrid	Select grids
Syntax	selgrid,grids ifile ofile
selgridname	Select grids by name
Syntax	selgridname,gridnames ifile ofile
selzaxis	Select z-axes
Syntax	selzaxis,zaxes ifile ofile
selzaxisname	Select z-axes by name
Syntax	selzaxisname,zaxisnames ifile ofile
selltype	Select GRIB level types
Syntax	selltype,types ifile ofile
seltabnum	Select parameter table numbers
Syntax	seltabnum,tabnums 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
selsmon	Select single month
Syntax	selsmon,month[,nts1[,nts2]] 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 ifnotthen	If then If not then
Syntax	<operator> ifile1 ifile2 ofile
ifthenelse	If then else
Syntax	ifthenelse ifile1 ifile2 ifile3 ofile
ifthenc ifnotthenc	If then constant If not then constant
Syntax	<operator>,c ifile ofile

Comparison

eq ne le lt ge gt	Equal Not equal Less equal Less than Greater equal Greater than
Syntax	<operator> ifile1 ifile2 ofile
eqc nec lec ltc gec gtc	Equal constant Not equal constant Less equal constant Less than constant Greater equal constant Greater than 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
setname	Set variable name
Syntax	setname,name ifile ofile
setlevel	Set level
Syntax	setlevel,level ifile ofile
setltype	Set GRIB level type
Syntax	setltype,ltype ifile ofile

setdate	Set date
Syntax	setdate,date ifile ofile
settime	Set time of the day
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
chname	Change variable name
Syntax	chname,oldname,newname,... 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,name,oldlev,newlev ifile ofile

setgrid	Set grid
Syntax	setgrid,grid ifile ofile
setgridtype	Set grid type
Syntax	setgridtype,gridtype ifile ofile

setzaxis	Set z-axis
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 latitudes
Syntax	invertlat ifile ofile

invertlev	Invert levels
Syntax	invertlev ifile ofile

maskregion	Mask regions
Syntax	maskregion,regions 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,newmiss 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
<div>Syntax</div>	expr , <i>instr</i> ifile ofile
exprf	Evaluate expressions from script file
<div>Syntax</div>	exprf , <i>filename</i> ifile ofile
abs	Absolute value
int	Integer value
nint	Nearest integer value
pow	Power
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
<div>Syntax</div>	<operator> ifile ofile

addc	Add a constant
subc	Subtract a constant
mulc	Multiply with a constant
divc	Divide by a constant
<div>Syntax</div>	<operator> , <i>c</i> 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
<div>Syntax</div>	<operator> ifile1 ifile2 ofile

monadd	Add monthly time series
monsub	Subtract monthly time series
monmul	Multiply monthly time series
mondiv	Divide monthly time series
<div>Syntax</div>	<operator> ifile1 ifile2 ofile

ymonadd	Add multi-year monthly time series
ymonsub	Subtract multi-year monthly time series
ymonmul	Multiply multi-year monthly time series
ymondiv	Divide multi-year monthly time series
<div>Syntax</div>	<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
<div>Syntax</div>	<operator> ifile ofile

Statistical values

Available statistical functions	<STAT>
minimum	min
maximum	max
sum	sum
mean	mean
average	avg
variance	var
standard deviation	std

ens<STAT>	Statistical values over an ensemble
<div>Syntax</div>	<operator> ifiles ofile
enspctl	Ensemble percentiles
<div>Syntax</div>	enspctl , <i>p</i> ifiles ofile

fld<STAT>	Statistical values over a field
<div>Syntax</div>	<operator> ifile ofile
fldpctl	Field percentiles
<div>Syntax</div>	fldpctl , <i>p</i> ifile ofile

zon<STAT>	Zonal statistical values
<div>Syntax</div>	<operator> ifile ofile
zonpctl	Zonal percentiles
<div>Syntax</div>	zonpctl , <i>p</i> ifile ofile

mer<STAT>	Meridional statistical values
<div>Syntax</div>	<operator> ifile ofile
merpctl	Meridional percentiles
<div>Syntax</div>	merpctl , <i>p</i> ifile ofile

vert<STAT>	Vertical statistical values
<div>Syntax</div>	<operator> ifile ofile
timsel<STAT>	Time range statistical values
<div>Syntax</div>	<operator> , <i>nsets</i> [, <i>noffset</i>][, <i>nskip</i>] ifile ofile

timselfctl	Time range percentiles
<div>Syntax</div>	timselfctl , <i>p</i> , <i>nsets</i> [, <i>noffset</i>][, <i>nskip</i>] ifile1 ifile2 ofile
run<STAT>	Running statistical values
<div>Syntax</div>	<operator> , <i>nts</i> ifile ofile

runpctl	Running percentiles
<div>Syntax</div>	runpctl , <i>p</i> , <i>nts</i> ifile1 ofile
tim<STAT>	Statistical values over all time steps
<div>Syntax</div>	<operator> ifile ofile

timpctl	Time percentiles
<div>Syntax</div>	timpctl , <i>p</i> ifile1 ifile2 ifile3 ofile
hour<STAT>	Hourly statistical values
<div>Syntax</div>	<operator> ifile ofile

hourpctl	Hourly percentiles
<div>Syntax</div>	hourpctl , <i>p</i> ifile1 ifile2 ifile3 ofile
day<STAT>	Daily statistical values
<div>Syntax</div>	<operator> ifile ofile

daypctl	Daily percentiles
<div>Syntax</div>	daypctl , <i>p</i> ifile1 ifile2 ifile3 ofile
mon<STAT>	Monthly statistical values
<div>Syntax</div>	<operator> ifile ofile

monpctl	Monthly percentiles
<div>Syntax</div>	monpctl , <i>p</i> ifile1 ifile2 ifile3 ofile
year<STAT>	Yearly statistical values
<div>Syntax</div>	<operator> ifile ofile

yearpctl	Yearly percentiles
<div>Syntax</div>	yearpctl , <i>p</i> ifile1 ifile2 ifile3 ofile
seas<STAT>	Seasonal statistical values
<div>Syntax</div>	<operator> ifile ofile

seaspctl	Seasonal percentiles
<div>Syntax</div>	seaspctl , <i>p</i> ifile1 ifile2 ifile3 ofile
yhour<STAT>	Multi-year hourly statistical values
<div>Syntax</div>	<operator> ifile ofile

yday<STAT>	Multi-year daily statistical values
<div>Syntax</div>	<operator> ifile ofile
ydaypctl	Multi-year daily percentiles
<div>Syntax</div>	ydaypctl , <i>p</i> ifile1 ifile2 ifile3 ofile

ymon<STAT>	Multi-year monthly statistical values
<div>Syntax</div>	<operator> ifile ofile
ymonpctl	Multi-year monthly percentiles
<div>Syntax</div>	ymonpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

yseas<STAT>	Multi-year seasonal statistical values
<div>Syntax</div>	<operator> ifile ofile
yseaspctl	Multi-year seasonal percentiles
<div>Syntax</div>	yseaspctl , <i>p</i> ifile1 ifile2 ifile3 ofile

ydrun<STAT>	Multi-year daily running statistical values
<div>Syntax</div>	<operator> , <i>nts</i> ifile ofile
ydrunpctl	Multi-year daily running percentiles
<div>Syntax</div>	ydrunpctl , <i>p</i> , <i>nts</i> ifile1 ifile2 ifile3 ofile

Regression

regres	Regression
<div>Syntax</div>	regres ifile ofile
detrend	Detrend
<div>Syntax</div>	detrend ifile ofile

trend	Trend
<div>Syntax</div>	trend ifile ofile1 ofile2
subtrend	Subtract trend
<div>Syntax</div>	subtrend ifile1 ifile2 ifile3 ofile

Interpolation

remapbil	Bilinear interpolation
remapbic	Bicubic interpolation
remapcon	Conservative remapping
remapdis	Distance-weighted average remapping
<div>Syntax</div>	<operator> , <i>grid</i> ifile ofile

genbil	Generate bilinear interpolation weights
genbic	Generate bicubic interpolation weights
gencon	Generate conservative interpolation weights
gendis	Generate distance-weighted average remap weights
<div>Syntax</div>	<operator> , <i>grid</i> ifile ofile

remap	SCRIP grid remapping
<div>Syntax</div>	remap , <i>grid</i> , <i>weights</i> ifile ofile
interpolate	PINGO grid interpolation
intgridbil	Bilinear grid interpolation
<div>Syntax</div>	<operator> , <i>grid</i> ifile ofile

remapeta	Remap vertical hybrid level
<div>Syntax</div>	remapeta , <i>vct</i> [, <i>oro</i>] ifile ofile
ml2pl	Model to pressure level interpolation
<div>Syntax</div>	ml2pl , <i>plevels</i> ifile ofile
ml2hl	Model to height level interpolation
<div>Syntax</div>	ml2hl , <i>hlevels</i> ifile ofile

intlevel	Linear level interpolation
<div>Syntax</div>	intlevel , <i>levels</i> ifile ofile
inttime	Time interpolation
<div>Syntax</div>	inttime , <i>date</i> , <i>time</i> [, <i>inc</i>] ifile ofile
intntime	Time interpolation
<div>Syntax</div>	intntime , <i>n</i> ifile ofile

intyear	Year interpolation
<div>Syntax</div>	intyear , <i>years</i> ifile1 ifile2 oprefix

Transformation

sp2gp	Spectral to gridpoint
sp2gpl	Spectral to gridpoint (linear)
gp2sp	Gridpoint to spectral
gp2spl	Gridpoint to spectral (linear)
<div>Syntax</div>	<operator> ifile ofile

sp2sp	Spectral to spectral
<div>Syntax</div>	sp2sp , <i>truncate</i> ifile ofile
spcut	Cut spectral wave number
<div>Syntax</div>	spcut , <i>wnums</i> ifile ofile

dv2uv	Divergence and vorticity to U and V wind
dv2uvl	Divergence and vorticity to U and V wind (linear)
uv2dv	U and V wind to divergence and vorticity
uv2dvl	U and V wind to divergence and vorticity (linear)
<div>Syntax</div>	<operator> ifile ofile

Formatted I/O

input	ASCII input
<div>Syntax</div>	input , <i>grid</i> ofile
inputsrv	SERVICE ASCII input
inputext	EXTRA ASCII input
<div>Syntax</div>	<operator> ofile

output	ASCII output
<div>Syntax</div>	output ifiles
outputf	Formatted output
<div>Syntax</div>	outputf , <i>format</i> , <i>nelem</i> ifiles
outputint	Integer output
outputsrv	SERVICE ASCII output
outputext	EXTRA ASCII output
<div>Syntax</div>	<operator> ifiles

Miscellaneous

gridarea	Grid cell area
<div>Syntax</div>	<operator> ifile ofile
gradsdes1	GrADS data descriptor file (version 1 GRIB map)
<div>Syntax</div>	gradsdes1 , <i>GrADS</i> data descriptor file (version 2 GRIB map)

smooth9	9 point smoothing
<div>Syntax</div>	smooth9 ifile ofile
setrtoc	Set range to constant
<div>Syntax</div>	setrtoc , <i>rmin</i> , <i>rmax</i> , <i>c</i> ifile ofile
setrtoc2	Set range to constant others to constant2
<div>Syntax</div>	setrtoc2 , <i>rmin</i> , <i>rmax</i> , <i>c</i> , <i>c2</i> ifile ofile

timsort	Sort over the time
<div>Syntax</div>	timsort ifile ofile
const	Create a constant field
<div>Syntax</div>	const , <i>const</i> , <i>grid</i> ofile
random	Create a field with random values
<div>Syntax</div>	random , <i>grid</i> ofile

rotuvb	Backward rotation
<div>Syntax</div>	rotuvb , <i>u</i> , <i>v</i> ,... ifile ofile
mastrfu	Mass stream function
<div>Syntax</div>	mastrfu ifile ofile

histcount	Histogram count
histsum	Histogram sum
histmean	Histogram mean
histfreq	Histogram frequency
<div>Syntax</div>	<operator> , <i>bounds</i> ifile ofile

wct	Windchill temperature
<div>Syntax</div>	wct ifile1 ifile2 ofile
fdns	Frost days where no snow index per time period
<div>Syntax</div>	fdns ifile1 ifile2 ofile

strwin	Strong wind days index per time period
<div>Syntax</div>	strwin [, <i>v</i>] ifile ofile
strbre	Strong breeze days index per time period
<div>Syntax</div>	strbre ifile ofile

strgal	Strong gale days index per time period
<div>Syntax</div>	strgal ifile ofile
hurr	Hurricane days index per time period
<div>Syntax</div>	hurr ifile ofile

import_amsr	Import AMSR binary files
<div>Syntax</div>	import_amsr ifile ofile

Climate indices

eca_cdd	Consecutive dry days index per time period
<div>Syntax</div>	eca_cdd ifile ofile
eca_cfd	Consecutive frost days index per time period
<div>Syntax</div>	eca_cfd ifile ofile

eca_csu	Consecutive summer days index per time period
<div>Syntax</div>	eca_csu [, <i>T</i>] ifile ofile
eca_cwd	Consecutive wet days index per time period
<div>Syntax</div>	eca_cwd ifile ofile

eca_cwdi	Cold wave duration index wrt mean of reference per
<div>Syntax</div>	eca_cwdi [, <i>nday</i> [, <i>T</i>]] ifile1 ifile2 ofile

eca_cwfi	Cold-spell days index wrt 10th percentile of reference period	eca_tx90p	Very warm days percent wrt 90th percentile of reference period
Syntax	eca_cwfi <i>[,nday]</i> ifile1 ifile2 ofile	Syntax	eca_tx90p ifile1 ifile2 ofile
eca_etr	Intra-period extreme temperature range		
Syntax	eca_etr ifile1 ifile2 ofile		
eca_fd	Frost days index per time period		
Syntax	eca_fd ifile ofile		
eca_gsl	Growing season length index		
Syntax	eca_gsl <i>[,nday[,T[,fland]]]</i> ifile1 ifile2 ofile		
eca_hd	Heating degree days per time period		
Syntax	eca_hd <i>[,T1[,T2]]</i> ifile ofile		
eca_hwdi	Heat wave duration index wrt mean of reference period		
Syntax	eca_hwdi <i>[,nday[,T]]</i> ifile1 ifile2 ofile		
eca_hwfi	Warm spell days index wrt 90th percentile of reference period		
Syntax	eca_hwfi <i>[,nday]</i> ifile1 ifile2 ofile		
eca_id	Ice days index per time period		
Syntax	eca_id ifile ofile		
eca_r10mm	Heavy precipitation days index per time period		
Syntax	eca_r10mm ifile ofile		
eca_r20mm	Very heavy precipitation days index per time period		
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 percent due to R75p days		
Syntax	eca_r75ptot ifile1 ifile2 ofile		
eca_r90p	Wet days wrt 90th percentile of reference period		
Syntax	eca_r90p ifile1 ifile2 ofile		
eca_r90ptot	Precipitation percent 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 percent 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 percent due to R99p days		
Syntax	eca_r99ptot ifile1 ifile2 ofile		
eca_rr1	Wet days index per time period		
Syntax	eca_rr1 ifile ofile		
eca_rx1day	Highest one day precipitation amount per time period		
Syntax	eca_rx1day <i>[,mode]</i> ifile ofile		
eca_rx5day	Highest five-day precipitation amount per time period		
Syntax	eca_rx5day <i>[,x]</i> ifile ofile		
eca_sdii	Simple daily intensity index per time period		
Syntax	eca_sdii ifile ofile		
eca_su	Summer days index per time period		
Syntax	eca_su <i>[,T]</i> ifile ofile		
eca_tg10p	Cold days percent wrt 10th percentile of reference period		
Syntax	eca_tg10p ifile1 ifile2 ofile		
eca_tg90p	Warm days percent wrt 90th percentile of reference period		
Syntax	eca_tg90p ifile1 ifile2 ofile		
eca_tn10p	Cold nights percent wrt 10th percentile of reference period		
Syntax	eca_tn10p ifile1 ifile2 ofile		
eca_tn90p	Warm nights percent wrt 90th percentile of reference period		
Syntax	eca_tn90p ifile1 ifile2 ofile		
eca_tr	Tropical nights index per time period		
Syntax	eca_tr <i>[,T]</i> ifile ofile		
eca_tx10p	Very cold days percent wrt 10th percentile of reference period		
Syntax	eca_tx10p ifile1 ifile2 ofile		