HOME_R
Fast documentation

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cost
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Requirements

- Software: homer.2.6.R under R 2.15

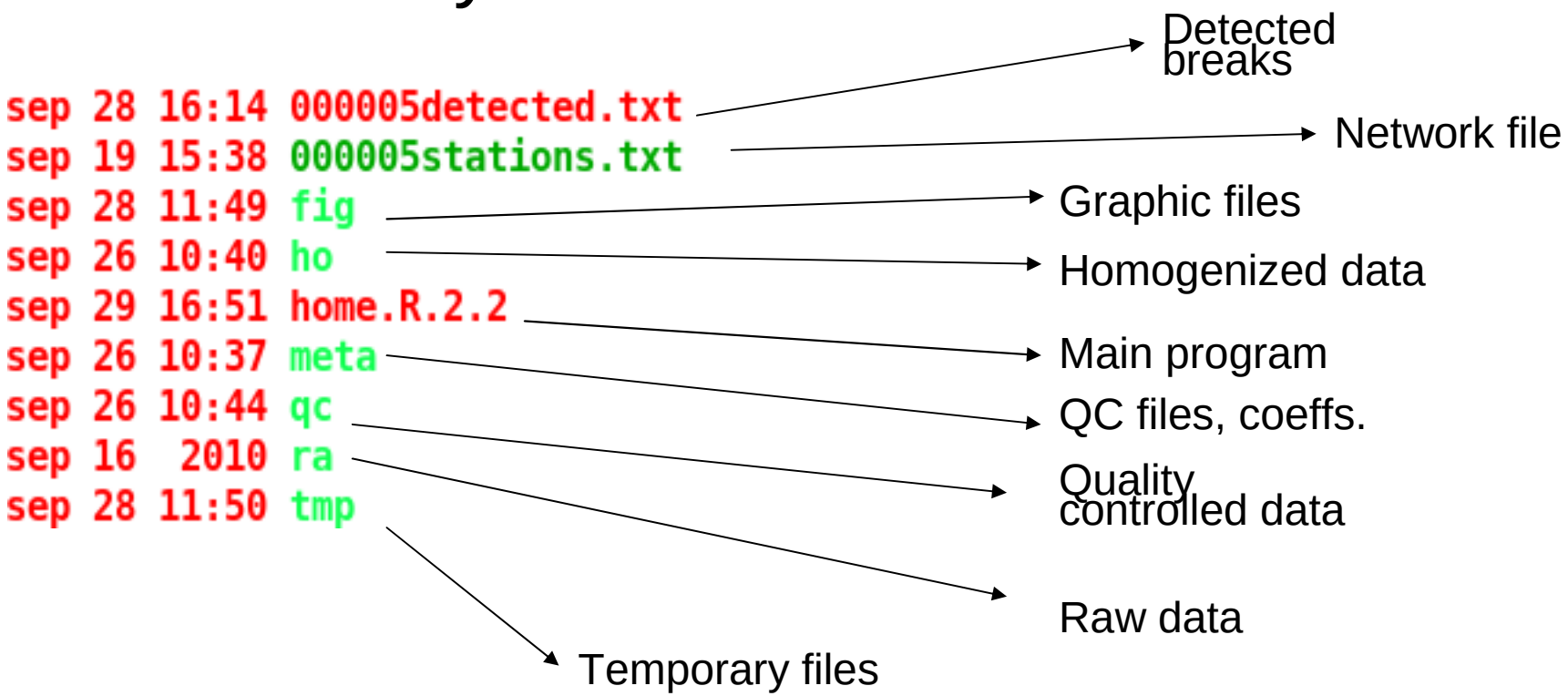
- Requires
  - GNU math library *GSL*
  - R packages “cghseg”, “maps”, “mapproj”

Main functions

- Basic checks (CLIMATOL)
- Fast QC
- Plotting series
- Detection (pairwise,joint detection,ACMANT)
- Correction

Directories/files

- Main directory



Network file

*nnnnnn*stations.txt nnnnnn network number
created by... you!
filename, latitude (° ' "), longitude, altitude, na me
Separator : tab
Station indices: 8 characters
Station names: no spaces allowed

qctnm44020001d.txt	47	9	0	-1	36	30	26.0	NANTES-BOUGUENAIS
qctnm44184001d.txt	47	14	0	-2	17	54	14.0	SAINT-NAZAIRE
qctnm49020001d.txt	47	28	42	0	36	48	50.0	BEAUCOUZE
qctnm49281001d.txt	47	9	0	0	44	18	203.0	SAINT-GEORGES-DES-GARDES
qctnm53094001d.txt	48	2	0	0	44	0	96.0	LAVAL-ENTRAMMES
qctnm53097001d.txt	48	10	6	0	23	30	107.0	EVRON
qctnm53185001d.txt	48	27	6	0	10	54	277.0	PRE-EN-PAIL
qctnm56069001d.txt	47	39	6	-3	30	6	41.0	GROIX
qctnm28070001d.txt	48	27	36	-1	30	0	155.0	CHARTRES
qctnm35281001d.txt	48	4	6	-1	44	0	36.0	RENNES
qctnm41097001d.txt	47	19	6	1	41	12	84.0	GIEVRES
qctnm61001001d.txt	48	26	42	0	6	36	143.0	ALENCON
qctnm61377001d.txt	48	43	24	0	43	48	4.0	ST-CORNIER-DES-LANDES
qctnm72181001d.txt	47	56	42	0	11	36	48.0	LE-MANS
qctnm85113001d.txt	46	41	36	-2	19	48	32.0	ILE-YEU
qctnm85152001d.txt	46	37	24	-1	38	0	50.0	LA-MOTHE-ACHARD
qctnm86027001d.txt	46	35	0	0	18	0	117.0	BIARD

Data file

- Year + 12 monthly values; separator: Tab
- Missing flag: -999.9
- Filename: *hhpp*m*xxxxxxxx*d.txt

hh = prefix (ra for raw, qc for QCed, ho for corrected)

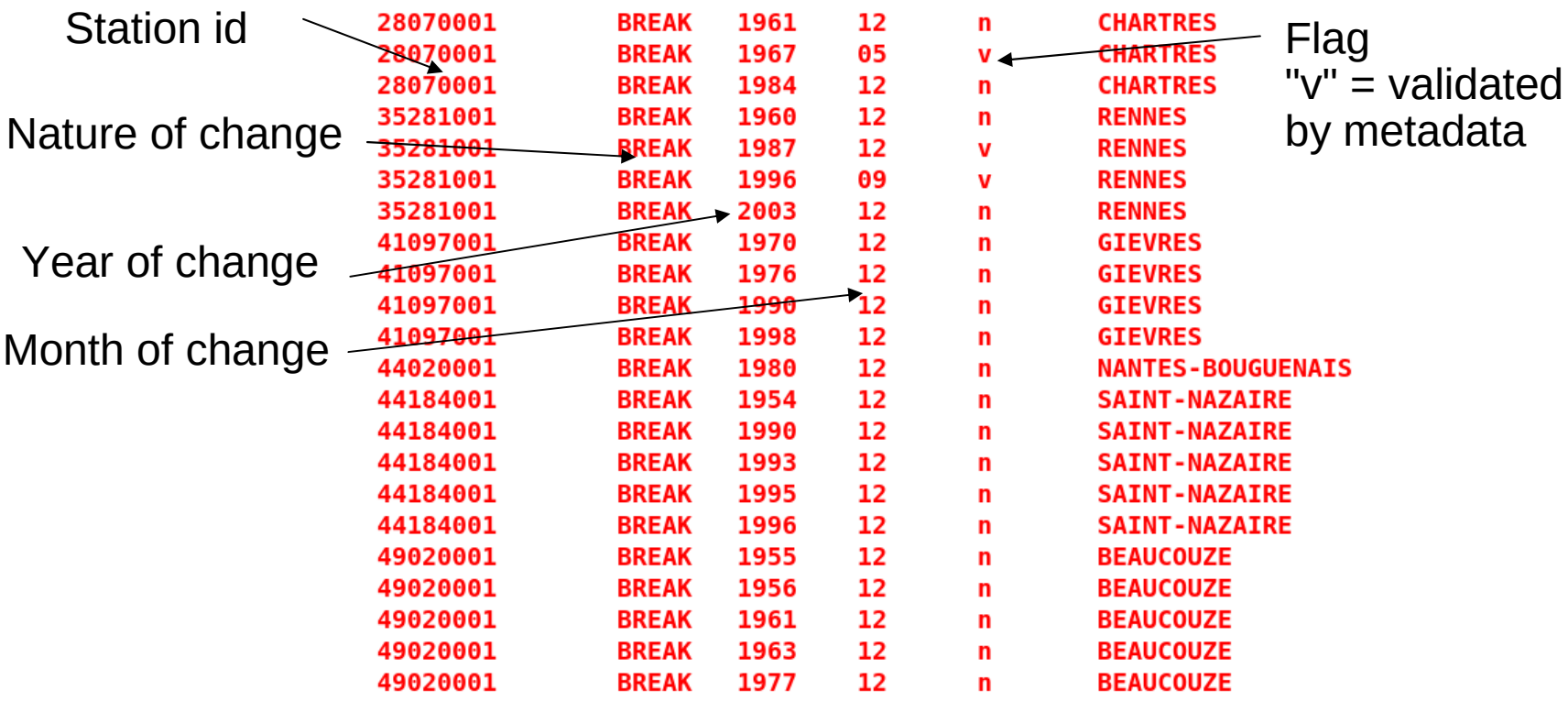
pp = parameter (ex: tn, tx, rr...)

- *xxxxxxxx* station id (8 characters)

1978	0.0	-1.9	5.8	8.1	12.7	16.3	17.3	17.4	14.4	9.9	1.6	-0.1
1979	-4.6	0.7	5.8	7.9	14.4	19.2	17.4	17.8	14.6	8.0	4.3	3.7
1980	-4.1	1.7	3.5	6.8	11.4	16.8	17.9	18.6	14.0	9.0	2.1	-0.4
1981	-2.5	0.8	7.8	8.9	14.5	18.5	19.1	19.4	15.6	10.0	4.7	-1.0
1982	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1983	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1984	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1985	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1986	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1987	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9
1988	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	-999.9	2.3
1989	0.1	4.1	7.4	10.6	14.0	15.9	20.1	19.0	14.9	10.0	2.7	0.5
1990	-0.4	4.2	8.0	8.6	15.1	17.4	18.8	20.1	13.1	9.8	5.3	-0.5
1991	-0.2	-3.5	6.1	8.3	11.2	16.8	20.9	19.6	16.3	8.3	4.5	-1.1
1992	1.4	2.8	5.0	9.7	14.9	18.4	20.9	23.7	15.7	8.4	4.6	0.1
1993	0.2	-2.5	3.7	10.2	17.2	18.2	18.9	19.4	14.9	10.1	0.8	1.5
1994	3.3	0.2	7.7	9.9	14.4	18.3	22.2	21.1	17.1	7.8	6.3	1.4
1995	-0.7	4.7	3.8	10.3	14.3	16.9	22.0	19.0	13.6	10.7	2.0	-0.9
1996	-3.4	-3.8	1.5	9.5	15.5	18.4	18.0	18.8	12.1	10.6	6.5	-3.0
1997	-3.2	2.5	4.6	7.0	15.4	18.1	18.8	19.9	14.7	7.2	4.8	2.0
1998	1.2	4.3	4.5	11.4	15.0	19.3	20.3	20.3	14.4	10.6	1.8	-1.7
1999	-0.2	0.4	6.6	11.0	15.4	17.8	20.6	18.7	17.2	10.1	3.2	0.2
2000	-2.2	3.7	5.7	13.1	16.8	19.5	18.6	21.3	14.9	12.5	7.6	1.5
2001	0.0	2.1	6.4	9.1	16.5	17.0	20.5	21.2	13.4	12.8	3.2	-3.3
2002	0.0	5.0	6.4	9.5	17.4	19.7	21.5	20.5	14.3	8.7	7.4	-1.1

Detected breaks

- Corresponds to network file *nnnnnn*detected.txt
- Created by HOMER



Initialization menu (part 1)

```
HOME_R  V2.2

____________________


Dataset parameters

Network number (ref station file)        : 5
Header of input files (ex: ratx, qcrr)   : qctx
Parameter name (for graphic outputs)     : TX
Unit for graphic outputs (c for celsius) : c

Parameter type
Physical parameters (Temperature, Pressure, ...)
=> Additive correction       : additive (return)
Cumulative parameters (Rainfall, Sunshine Duration, ...)
=> Multiplicative correction : log ratio (log) or ratio (r) comparisons
Type        :

Graphic outputs
pdf (return), postscript (ps), svg (svg), png (png)
Output option          :

Interactive option
Yes (return) or no (n)
Interactive option   :
```

Network 000005

qctxmxxxxxxxxd.txt files in qc directory

What you want, could have been "Maximum Temperatures"

Will produce a nice "℃" in outputs"

Temperatures = additive parameter (return)

Interactive option allows control interactively detection outputs

Initialization menu (part 2)

```
Intercomparison Neighbourhood
All series (return), geographic (g) or correlation (c) distance
Intercomparison type          : c
Minimum correlation r         : .9
!! Warning, next parameter
!! superseeds r.min or d.max
Minimum number of neighbours  : 6

Season comparison option for pairwise detection
Annual+seasons (return), annual (a) or monthly (m)
Season option         :

Options for series visualization
Linear trend?           yes (return)/n :
Smoothing option?       yes (return)/n :
Polygon fill?           yes (return)/n :
return for red/blue gy=green/yellow.. :
```

For small networks within the same climate region, keep all series; otherwise, correlation neighbourhood (1st differenced series) is recommended

Ex : Will select all series with Correlation > 0.9

If less than 6 series, will also pick up series less correlated (up to 6 series)

Recommanded for temperatures

Adds linear trend/smoothed trend

Fills with color above/below mean

rb = red above, blue below

Also available : g (green), y (yellow)

Input checks

Checks if directories are present, and creates them if necessary

Checks consistency between station files and data files (wrong network or header)

```
          Dataset parameters

fig directory created
ho directory created
meta directory created
ra directory created
tmp directory created

      Network number (ref station file)        : 1
      Header of input files (ex: ratx, qcrr)   : qcsn

qc/qcsnm00000001d.txt  does not exist: create it
RETURN when done, or q to exit HOMER: q
Inconsistencies between input (station file or header) and datafiles

>
```

Actions : Main Menu

```
What do you wish, Master/Mistress?

 FAST QUALITY CONTROL
 -> Fast CLiMATOL checks                  type i
 -> Fast QC                               type f
 -> Outlier file creation?                type o
 -> Removal of outliers?                  type r

 HOMOGENISATION
 -> Pairwise detection?                   type d
 -> Joint detection?                      type j
 -> ACMANT detection?                     type a
 -> Assess Month of change                type m
 -> Correction?                           type c
 -> Visualization?                        type v
 -> New neighbourhood                     type n
 -> Change hinteraction hoption :-)       type h
 -> Break file creation/modification?     type b
 -> Break file edition?                   type e
 -> Quit?                                 type q

Your choice    :
```

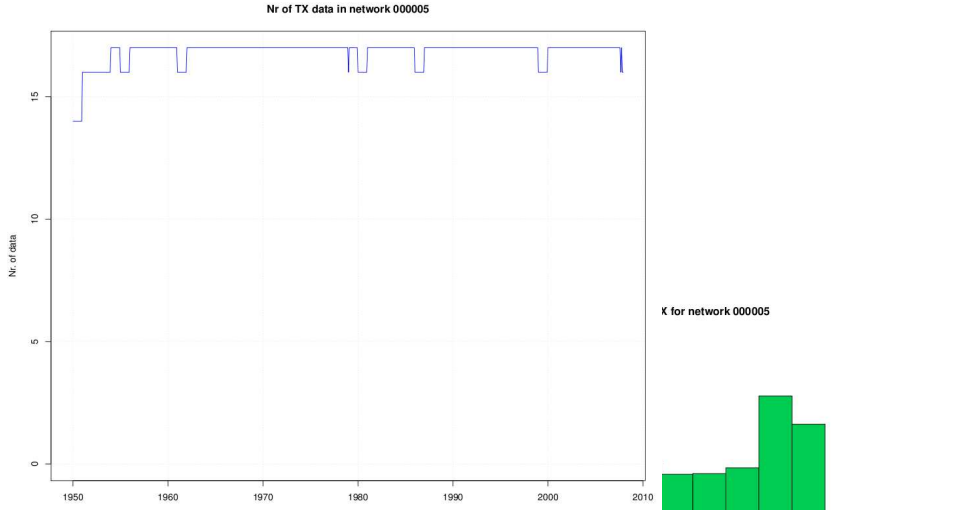
Automatic gender detection not implemented yet

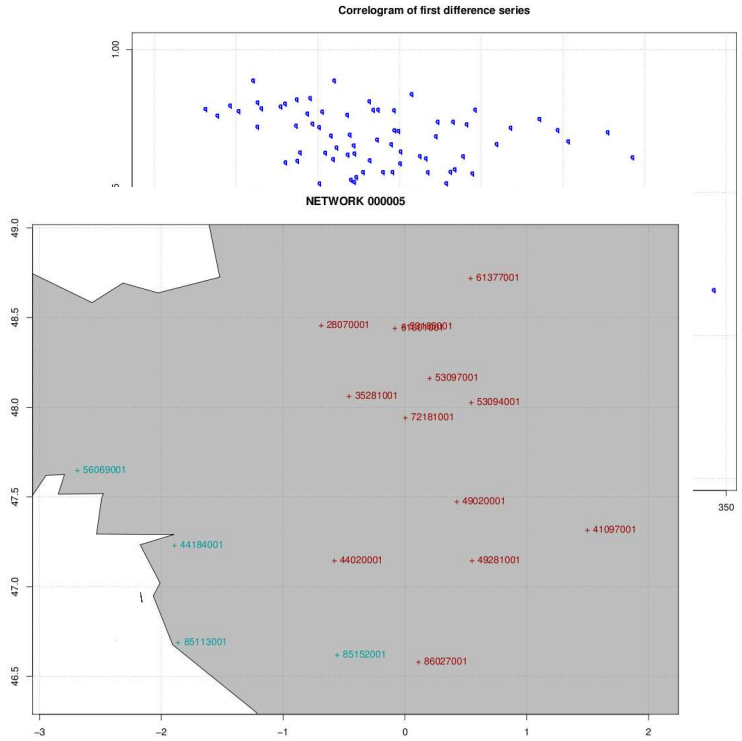
ACMANT (a)
Assess Month of change (m)

Those options appear only after a first correction round

CLiMATOL Checks (i)

- General properties for *nnnnnn*stations.txt network
- Stored in meta/*hhppnnnnnn*diagnosis





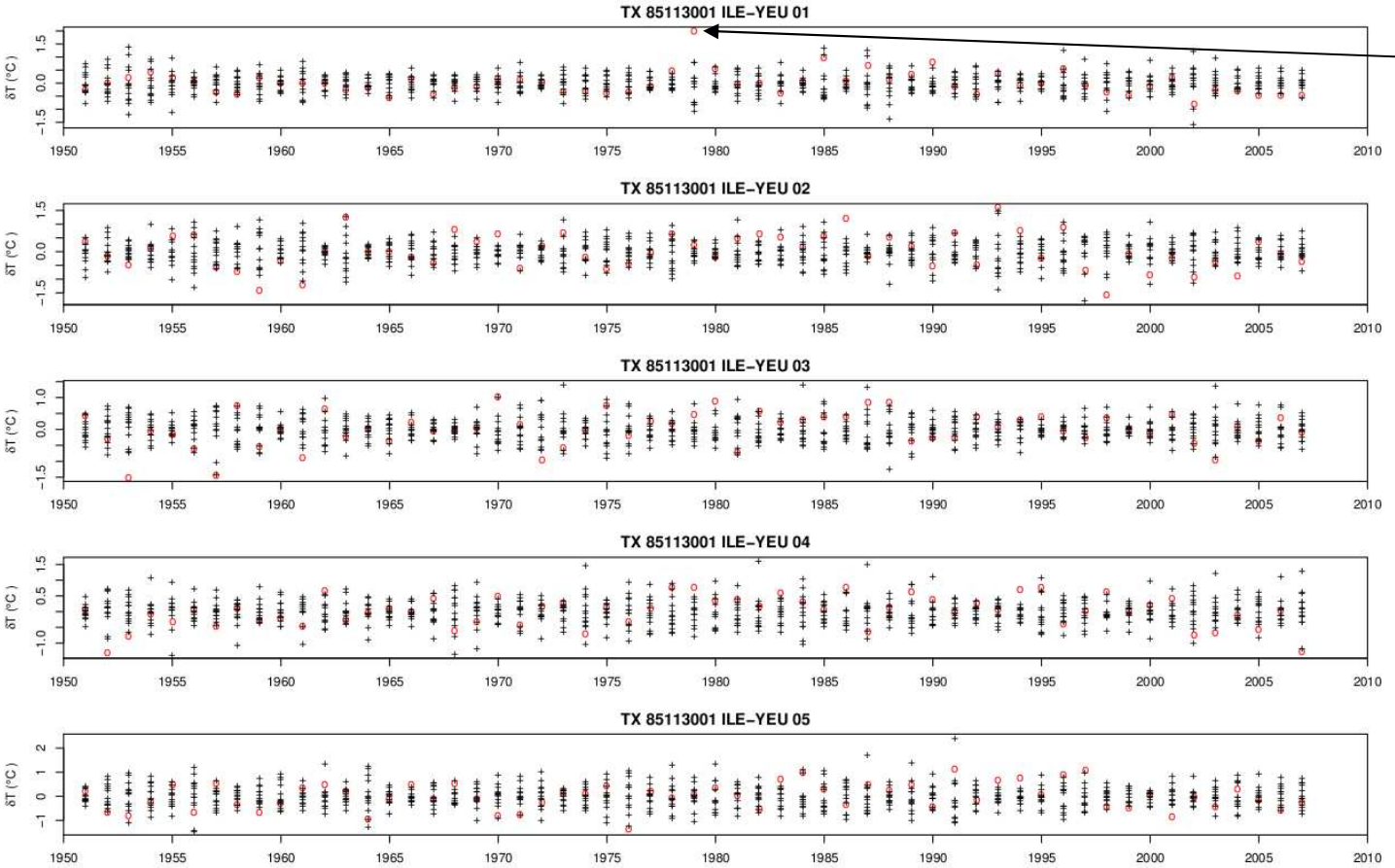
Fast Quality Control (f)

```
     Your choice    : f
     raw/qc (return) or corrected (c) files    :

44020001 NANTES-BOUGUENAIS
====================================
85152001 0.975 LA-MOTHE-ACHARD
35281001 0.972 RENNES
49020001 0.971 BEAUCOUZE
49281001 0.970 SAINT-GEORGES-DES-GARDES
72181001 0.964 LE-MANS
85113001 0.959 ILE-YEU
53185001 0.958 PRE-EN-PAIL
53094001 0.954 LAVAL-ENTRAMMES
61001001 0.951 ALENCON
86027001 0.942 BIARD
61377001 0.941 ST-CORNIER-DES-LANDES
44184001 0.936 SAINT-NAZAIRE
53097001 0.936 EVRON
56069001 0.932 GROIX
41097001 0.929 GIEVRES
28070001 0.920 CHARTRES


44184001 SAINT-NAZAIRE
====================================
56069001 0.961 GROIX
85113001 0.959 ILE-YEU
35281001 0.944 RENNES
44020001 0.936 NANTES-BOUGUENAIS
61377001 0.922 ST-CORNIER-DES-LANDES
53185001 0.914 PRE-EN-PAIL
53094001 0.913 LAVAL-ENTRAMMES
```

Performs QC on input files or on corrected files

Running…
Here with correlation neighbourhood.

meta/control_qctxxxxxxxxx.pdf



Outlier for Île d'Yeu series, january 1979

Create Outlier file (o)

```
Your choice    : o
raw/qc (return) or corrected (c) files    :


    ! hint: entering 13 when month is asked forces all
            months of corresponding year as outliers



 44020001 NANTES-BOUGUENAIS
 ==========================================

    New date (return to quit)      :

 85113001 ILE-YEU
 ==========================================

    New date (return to quit)      : 1979
    Month (13 for whole year) : 1

    New date (return to quit)      :

 85152001 LA-MOTHE-ACHARD
 ==========================================

    New date (return to quit)      :
```

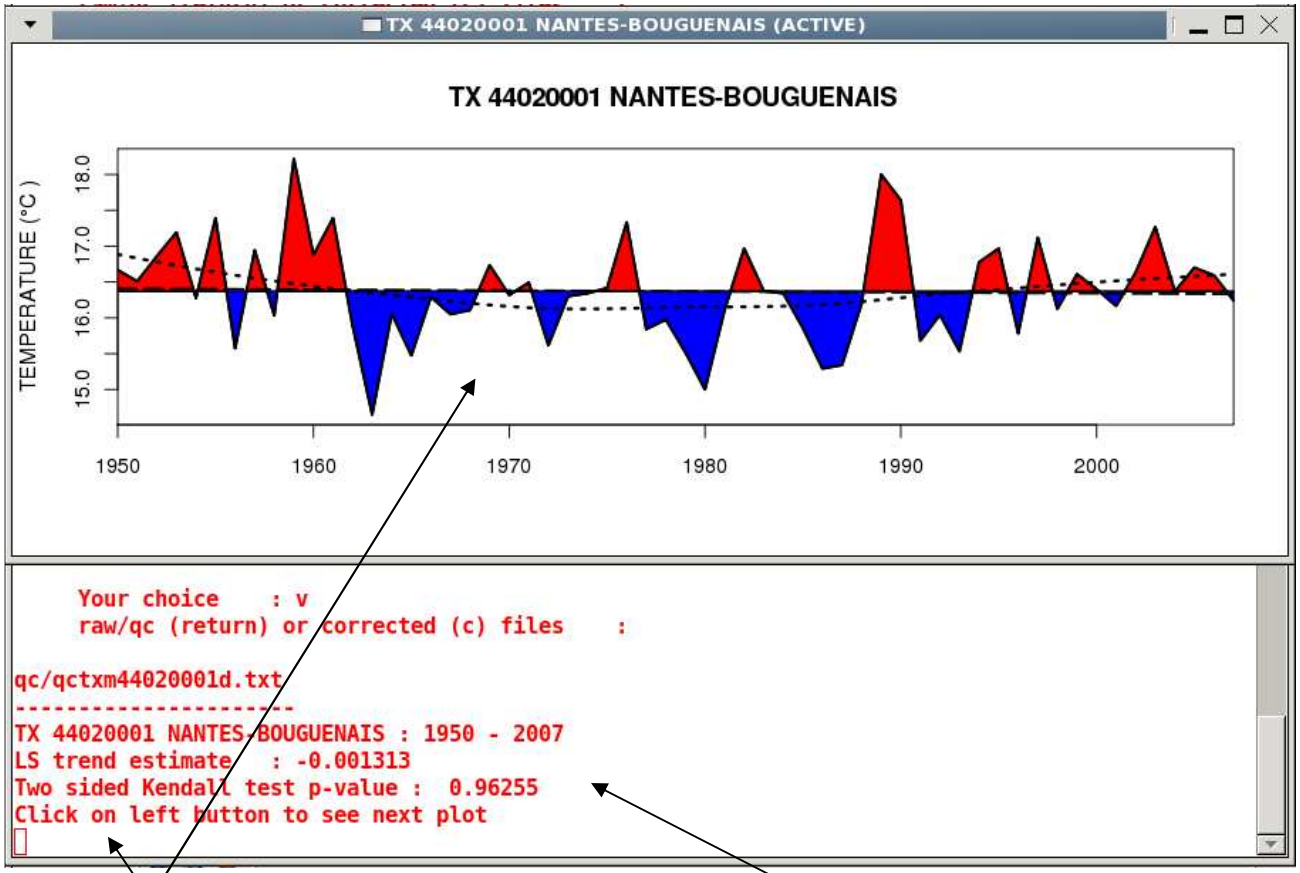
home.R.2.2 | qctx000005outliers.txt

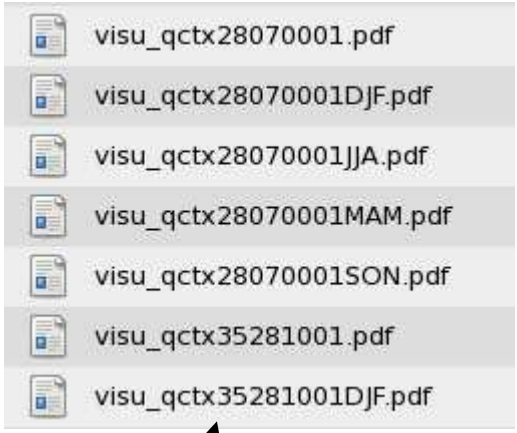
```
1 qc/qctxm85113001d.txt          1979      1          ILE-YEU
2
```

Creates outlier file

Action (r) changes all entries to missing in the corresponding datafiles

Visualisation (v)





Files created in "fig" directory

Season option turned on

DJF = winter series
JJA – summer serie

Etc… also created

Creates window (interactive option turned on)

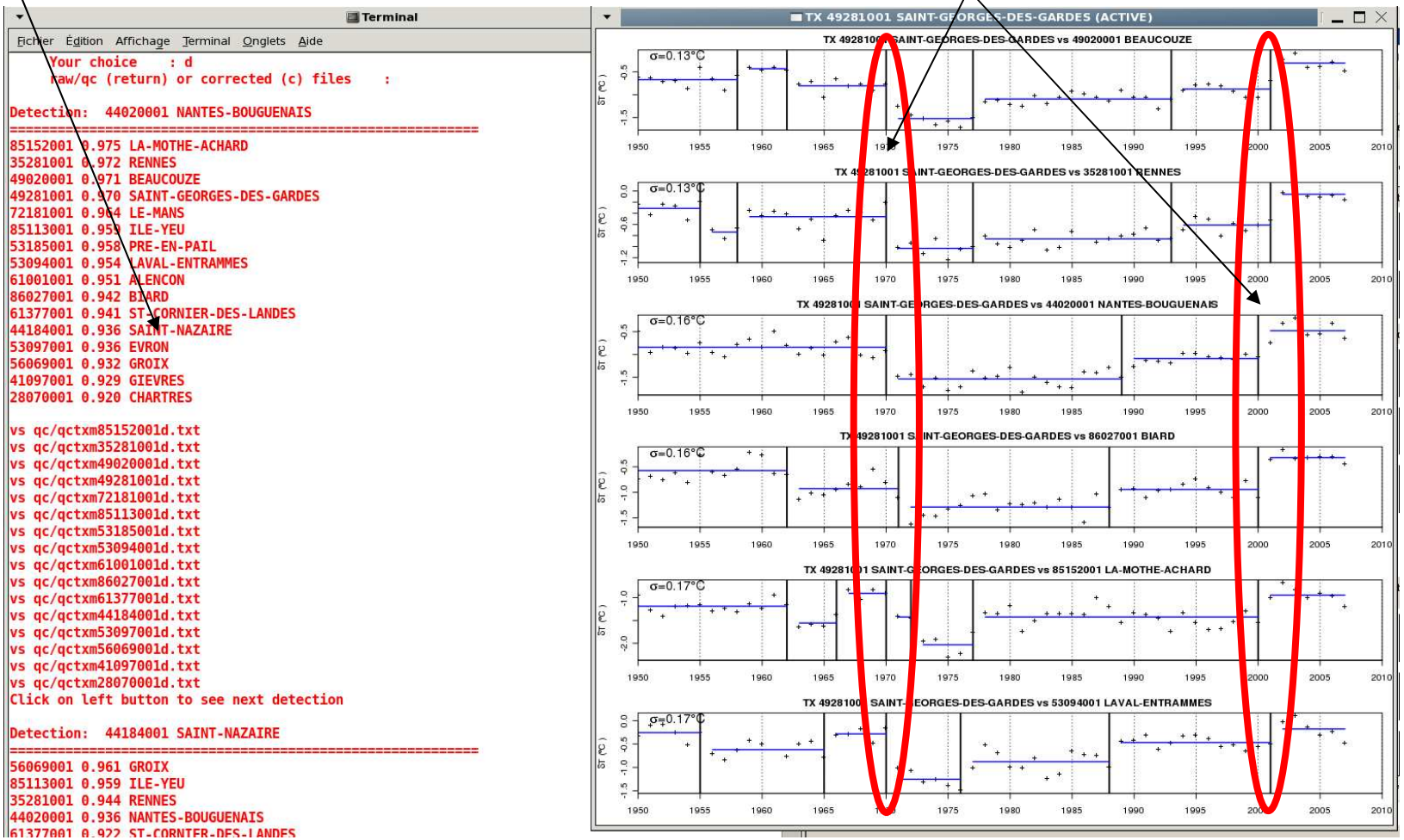
Assesses significance of the linear trend

(non significant here: large p-value)

Pairwise detection (d)

Running pairwise on computed neighbourhoods

Probable breaks on St Georges TX

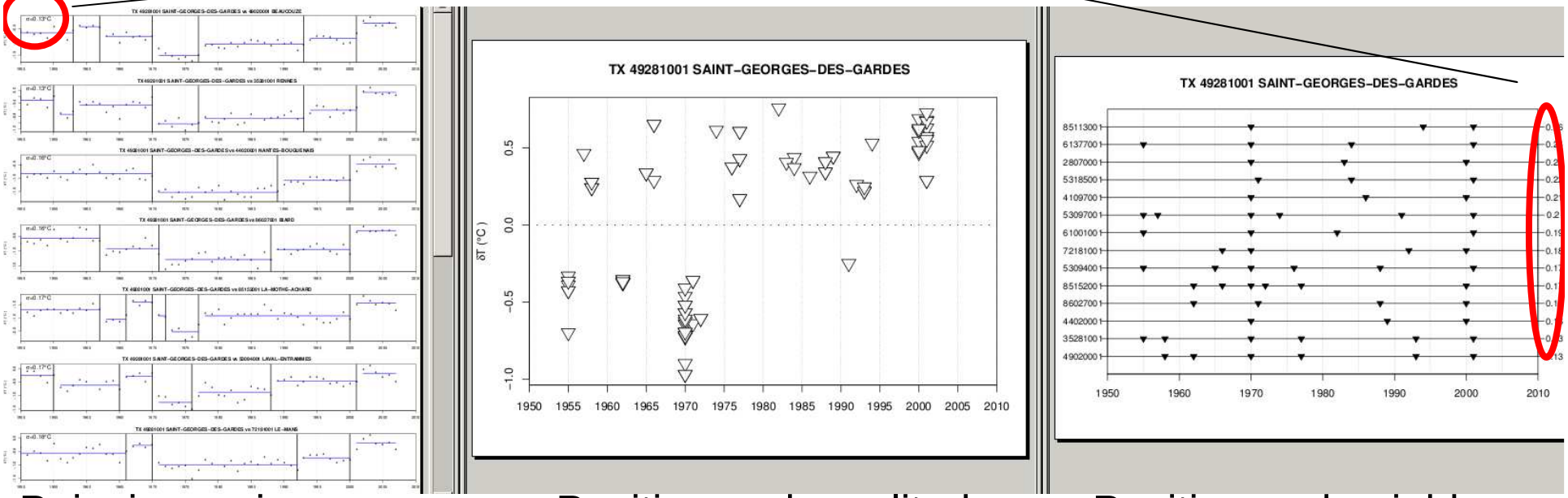


Pairwise detection

- "d" : performs detection on specified files (input or corrected)
- Uses predefined neighbourhoods – changed using "n" option
  For clarity reasons, pop up windows only show 6 pairwise detections with lowest sigma (interactive option turned on)
- Detection performed on *annual+seasonal, annual* or *monthly* (not recommended)
- Does not create "detected" file

Pairwise detection output files

Sigma values (noise intensity)



Pairwise series

Position and amplitude of detected breaks

Position and neighbour of detected breaks

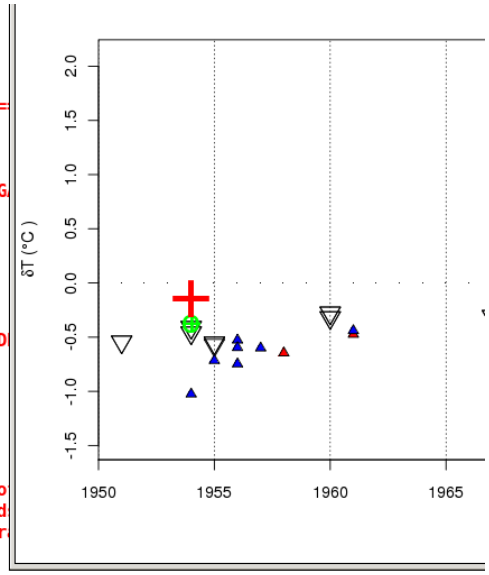
fig/detect_qctx49281001_a.pdf

fig/detect_qctx49281001_b.pdf

fig/detect_qctx49281001_c.pdf

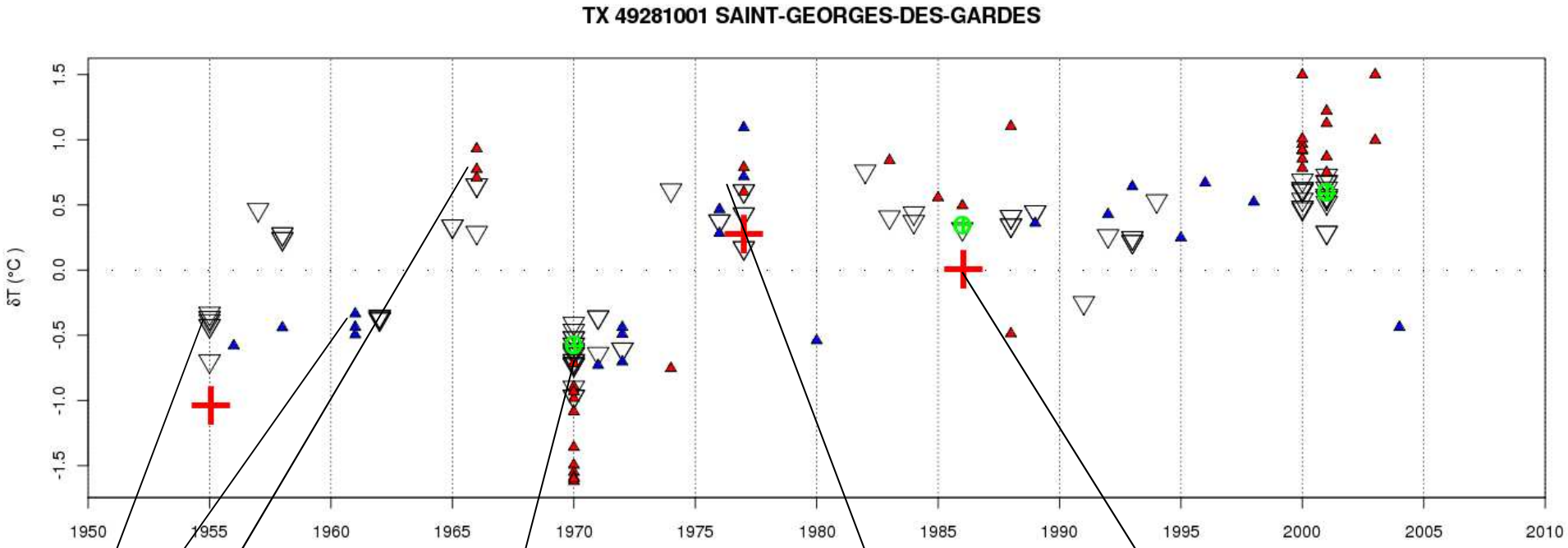
Joint detection (j)

```
     Your choice    : j
     raw/qc (return) or corrected

44020001 NANTES-BOUGUENAIS
==================================
85152001 0.975 LA-MOTHE-ACHARD
35281001 0.972 RENNES
49020001 0.971 BEAUCOUZE
49281001 0.970 SAINT-GEORGES-DES-G
72181001 0.964 LE-MANS
85113001 0.959 ILE-YEU
53185001 0.958 PRE-EN-PAIL
53094001 0.954 LAVAL-ENTRAMMES
61001001 0.951 ALENCON
86027001 0.942 BIARD
61377001 0.941 ST-CORNIER-DES-LAND
44184001 0.936 SAINT-NAZAIRE
53097001 0.936 EVRON
56069001 0.932 GROIX
41097001 0.929 GIEVRES
28070001 0.920 CHARTRES

[raw data: check] minimum number o
[raw data: check] number of record
[raw data: format] changing datafr
[multiseg] ILS running
[multiseg] ILS running

44184001 SAINT-NAZAIRE
==================================
56069001 0.961 GROIX
85113001 0.959 ILE-YEU
35281001 0.944 RENNES
44020001 0.936 NANTES-BOUGUENAIS
61377001 0.922 ST-CORNIER-DES-LANDES
53185001 0.914 PRE-EN-PAIL
53094001 0.913 LAVAL-ENTRAMMES
85152001 0.910 LA-MOTHE-ACHARD
49020001 0.909 BEAUCOUZE
61001001 0.902 ALENCON

[raw data: check] minimum number of positions per signal
[raw data: check] number of records per position
[raw data: format] changing dataframe to compact format (list)
```



- Automatically creates a "detected" file
- Interactive window for modifications

Joint detection (j)



Pairwise

(annual, JJA, DJF)

⊕ = joint detection

(automatic)

adds a break removes a break

position on y axis is not important

+ interactive modifications

Result of joint detection

- St Georges
  - 1970 2001 Automatic
  - 1955 1977 Added interactively
  - 1986 Removed interactively

000005detected.txt

1	44184001	BREAK	1954	12	n	SAINT-NAZAIRE
2	44184001	BREAK	1974	12	n	SAINT-NAZAIRE
3	44184001	BREAK	1994	12	n	SAINT-NAZAIRE
4	49281001	BREAK	1955	12	n	SAINT-GEORGES-DES-GARDES
5	49281001	BREAK	1970	12	n	SAINT-GEORGES-DES-GARDES
6	49281001	BREAK	1977	12	n	SAINT-GEORGES-DES-GARDES
7	49281001	BREAK	2001	12	n	SAINT-GEORGES-DES-GARDES
8	53097001	BREAK	1974	12	n	EVRON
9	53097001	BREAK	1988	12	n	EVRON
10	61001001	BREAK	1969	12	n	ALENCON
11	61001001	BREAK	1982	12	n	ALENCON
12	85113001	BREAK	1977	12	n	ILE-YEU
13	85113001	BREAK	1996	12	n	ILE-YEU
14	85152001	BREAK	1977	12	n	LA-MOTHE-ACHARD
15	85152001	BREAK	1988	12	n	LA-MOTHE-ACHARD

Correction (c)

- Always performed on input files - not on already corrected data
- A pairwise detection phase on corrected series is launched immediately afterwards

```
     Your choice    : c

Correction of:  44020001 NANTES-BOUGUENAIS
============================================
85152001 0.975 LA-MOTHE-ACHARD
35281001 0.972 RENNES
49020001 0.971 BEAUCOUZE
49281001 0.970 SAINT-GEORGES-DES-GARDES
72181001 0.964 LE-MANS
85113001 0.959 ILE-YEU
53185001 0.958 PRE-EN-PAIL
53094001 0.954 LAVAL-ENTRAMMES
61001001 0.951 ALENCON
86027001 0.942 BIARD
61377001 0.941 ST-CORNIER-DES-LANDES
44184001 0.936 SAINT-NAZAIRE
53097001 0.936 EVRON
56069001 0.932 GROIX
41097001 0.929 GIEVRES
28070001 0.920 CHARTRES
```

Common problem

A common mistake is to have only missing values between two breaks.

Shall this situation occur, the program will stop and ask you to remove one of the two breaks. In the example below, Rennes series has no data between 1928 and 1930, hence estimation cannot be performed. One of the two breaks has to be removed.

```
     Your choice    : c

Correction of:  44184001 SAINT-NAZAIRE
===============================================

Correction of:  49281001 SAINT-GEORGES-DES-GARDES
===============================================

Correction of:  56069001 GROIX
===============================================

Correction of:  35281001 RENNES
===============================================
 Warning! No data for series 35281001 during period 35281001 1928 - 1930 and month 1
 Check inconsistencies in change-point dates (RETURN) or quit HOMER (q):

 keep: 35281001 1927 12 RENNES      y (RETURN) or no (n) :
 keep: 35281001 1930 12 RENNES      y (RETURN) or no (n) :n
```

Correction (c)

- Corrected data are stored in ho/ho*pp*m*xxxxxxxx*d.txt
- Correction neighbourhoods and coefficients are provided in meta/meta*ppxxxxxxxx*.txt

hotxm49281001d.txt

1950	6.0	11.5	13.9	14.8	21.0	26.1	26.5	25.1	19.5	15.9	12.1	5.0
1951	8.8	9.4	9.8	15.3	16.3	22.4	25.7	22.3	21.8	15.8	12.4	9.9
1952	6.8	7.5	13.7	17.5	22.7	26.4	27.2	25.2	17.5	15.5	8.5	7.1
1953	2.9	7.3	15.5	16.5	22.4	22.9	23.4	26.9	22.8	16.8	10.3	11.5
1954	6.1	6.6	12.9	15.5	19.6	21.4	22.0	22.2	19.8	18.5	12.4	9.8
1955	8.9	8.9	9.5	17.5	18.3	23.6	27.5	27.9	23.4	15.9	11.3	10.4
1956	8.4	1.8	13.3	14.6	21.6	20.1	23.7	20.9	21.7	16.1	9.5	8.8
1957	7.4	11.0	16.4	16.4	17.8	24.4	24.5	23.5	20.4	18.0	9.2	6.7
1958	8.3	11.4	10.4	14.4	20.0	21.0	23.3	22.9	22.9	15.2	9.7	8.6
1959	8.0	9.9	14.8	16.1	20.5	24.5	28.5	26.8	25.5	19.4	12.0	9.6
1960	7.7	9.3	13.8	16.2	21.8	25.7	22.5	24.2	20.5	16.0	13.1	6.7
1961	8.2	12.8	15.4	17.7	19.6	23.2	25.5	25.2	25.5	17.3	9.8	7.5
1962	8.4	7.8	8.7	14.9	17.5	24.1	24.8	25.6	21.6	17.6	9.7	5.5
1963	0.9	4.0	11.9	14.1	17.8	21.3	24.5	20.7	19.5	16.3	13.1	4.8
1964	4.2	8.8	10.4	14.3	20.6	22.3	26.4	25.6	23.4	14.6	10.1	6.8
1965	7.6	5.3	11.5	14.3	19.0	21.6	22.1	21.8	17.7	17.4	10.2	10.0
1966	6.8	12.3	11.7	15.7	18.7	23.2	22.6	23.0	23.4	16.4	8.8	9.3
1967	7.5	9.2	12.3	14.3	18.3	22.1	27.4	24.9	20.1	17.7	9.8	6.5
1968	8.2	7.7	11.9	16.3	17.2	22.4	24.5	23.0	20.0	17.9	10.9	6.1
1969	8.9	6.8	10.8	15.3	18.8	21.4	27.1	25.6	21.4	20.4	10.9	5.5
1970	7.9	8.4	9.2	12.7	20.0	25.5	24.2	24.8	22.7	15.5	13.6	5.3
1971	8.6	8.6	9.2	17.9	19.7	20.0	26.6	23.7	22.2	18.3	10.3	7.3
1972	6.5	9.6	13.8	13.4	16.4	19.6	24.9	22.9	19.2	16.3	11.2	8.7
1973	5.6	6.8	12.2	13.7	19.0	23.9	23.9	26.0	23.1	15.0	11.4	6.9
1974	9.4	9.1	12.0	15.2	18.5	22.9	25.0	25.9	18.9	11.9	11.2	10.1
1975	9.7	11.4	9.7	14.5	16.7	22.7	25.4	26.9	21.0	14.9	10.5	4.4
1976	7.0	9.1	11.5	15.4	21.3	29.1	26.8	27.2	20.5	16.0	9.9	5.9
1977	6.7	10.3	13.3	13.6	17.5	19.6	23.1	22.5	21.0	18.0	10.8	9.6
1978	6.4	8.7	11.5	12.1	18.0	20.5	22.5	22.5	21.5	17.7	11.8	8.5
1979	3.9	7.5	9.9	13.0	17.0	21.2	24.4	21.7	21.7	16.2	10.9	9.3
1980	4.7	9.9	9.5	14.0	17.6	20.0	21.1	23.9	21.9	14.9	8.6	6.8
1981	7.2	6.5	13.0	14.5	16.5	20.6	21.8	25.0	21.3	14.8	10.8	7.6
1982	9.0	9.0	11.3	15.3	19.8	23.5	25.7	22.6	23.4	15.0	11.7	7.6
1983	8.7	5.8	11.1	12.9	16.2	23.3	27.8	23.8	21.1	16.0	11.0	7.7

metatx49281001d.txt

```
49281001 SAINT-GEORGES-DES-GARDES
====================================
CORRECTION NEIGHBORHOOD
49020001 0.977 BEAUCOUZE
44020001 0.970 NANTES-BOUGUENAIS
35281001 0.969 RENNES
86027001 0.968 BIARD
72181001 0.964 LE-MANS
85152001 0.962 LA-MOTHE-ACHARD
61001001 0.958 ALENCON
53094001 0.958 LAVAL-ENTRAMMES
41097001 0.954 GIEVRES
53097001 0.947 EVRON
85113001 0.938 ILE-YEU
53185001 0.937 PRE-EN-PAIL
28070001 0.934 CHARTRES
61377001 0.930 ST-CORNIER-DES-LANDES
====================================
Periode 1
49281001 1950 - 1955
01 :  -0.02
02 :   0.31
03 :   0.44
04 :   0.53
05 :   0.45
06 :   0.36
07 :   0.16
08 :   0.24
09 :   0.31
10 :   0.46
11 :   0.12
12 :   0.01
13 :   0.28
BREAK AMPLITUDE :  -0.13
```

Correction

Each time a correction is performed, the current version of the detected file is stored in the "tmp" directory, so you can go back to earlier version at any time:

*nnnnn*detected.txt.1

*nnnnn*detected.txt.2

*nnnnn*detected.txt.3

Etc…

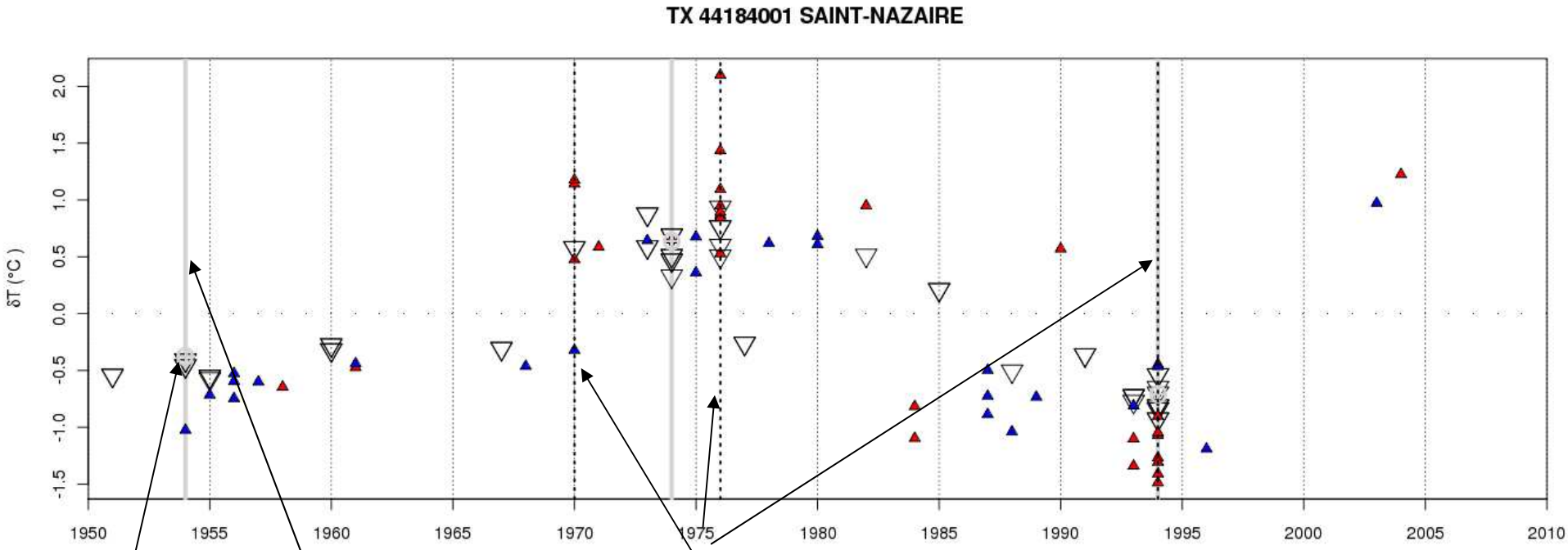
ACMANT detection (a)

- Option available only for additive parameters
- Runs with pre-homogenised reference series

  Option available only after a 1st correction round

- Strength: joint detection of changes in annual means and seasonal cycle
- Automatic

ACMANT Detection (a)



Dotted lines = ACMANT detections

Grey line = dates already in *nnnnnn*detected.txt

Grey (+) symbols = previous joint detections

Maybe interactively modified (same as joint detection)

Assess month (m)

- Option available only for additive parameters
- Runs with pre-homogenised reference series

  Option available only after a 1st correction round

```
Your choice    : m
raw/qc (return) or corrected (c) files    :

44020001 NANTES-BOUGUENAIS
===================================
1963/12->1963/3
1967/12->1967/11
1989/12->1991/11

44184001 SAINT-NAZAIRE
1954/12->1955/3
1976/12->1977/3
1994/12->1994/10

49020001 BEAUCOUZE
===================================
1951/12->1952/5
1954/12->1955/5
```

performed on serial deseasonalized series

Break file creation/modification (b)

- Create or add dates to *nnnnnn*detected.txt

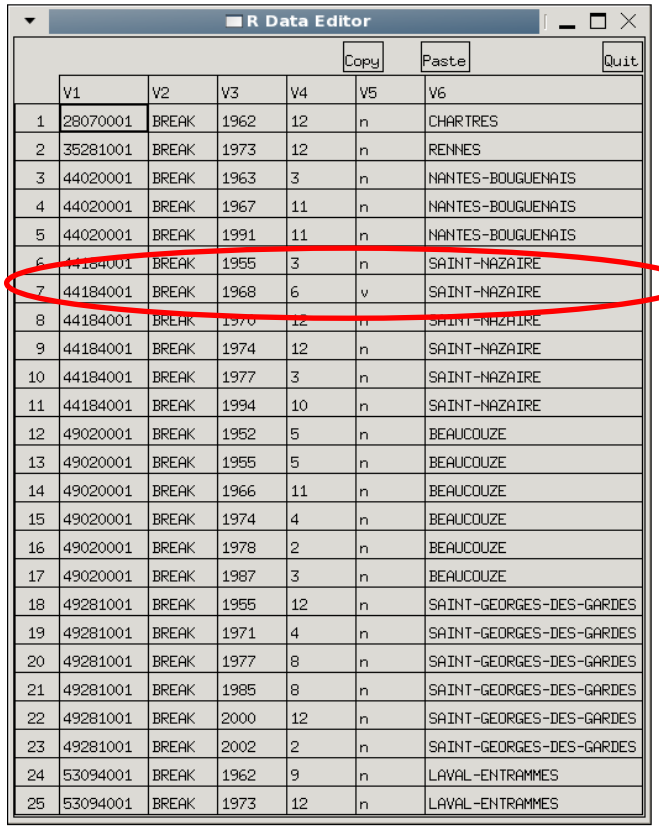
```
Your choice    : b


    BREAK : Abrupt shift
    BEGTR : Beginning of a progressive shift (linear)
    ENDTR : End of a progressive shift (linear)
    ! hint: entering b when date is asked forces BEGTR to the start of the series
    ! hint: entering e when date is asked forces ENDTR to the end of the series
    OUTLI : Outlier (Natural : caused by local thunderstorm for example)
            Note that erroneous data have to be put as missing in files

    New dates are taken until an empty date is typed (return)
    Dates have to be typed from most ancient to most recent
    Different shift types may have same date



44020001 NANTES-BOUGUENAIS
======================================


    New date (return to quit)           :

44184001 SAINT-NAZAIRE
======================================


    New date (return to quit)           : 1968
    Month (return for end of year)      : 6
    Metadata? (return for no, y for yes) : y
    BREAK : return
    BEGTR : b
    ENDTR : e
    OUTLI : o
    Your choice             :

    New date (return to quit)           :

49020001 BEAUCOUZE
======================================
```

Automatic Menu

Asks if more dates are to be added for each series

Break file edition (e)

- Edits *nnnnnn*detected.txt content (R editor)
- Convenient to modify dates/validation flags



	V1	V2	V3	V4	V5	V6
1	28070001	BREAK	1962	12	n	CHARTRES
2	35281001	BREAK	1973	12	n	RENNES
3	44020001	BREAK	1963	3	n	NANTES-BOUGUENAIS
4	44020001	BREAK	1967	11	n	NANTES-BOUGUENAIS
5	44020001	BREAK	1991	11	n	NANTES-BOUGUENAIS
6	44184001	BREAK	1955	3	n	SAINT-NAZAIRE
7	44184001	BREAK	1968	6	v	SAINT-NAZAIRE
8	44184001	BREAK	1970	12	n	SAINT-NAZAIRE
9	44184001	BREAK	1974	12	n	SAINT-NAZAIRE
10	44184001	BREAK	1977	3	n	SAINT-NAZAIRE
11	44184001	BREAK	1994	10	n	SAINT-NAZAIRE
12	49020001	BREAK	1952	5	n	BEAUCOUZE
13	49020001	BREAK	1955	5	n	BEAUCOUZE
14	49020001	BREAK	1966	11	n	BEAUCOUZE
15	49020001	BREAK	1974	4	n	BEAUCOUZE
16	49020001	BREAK	1978	2	n	BEAUCOUZE
17	49020001	BREAK	1987	3	n	BEAUCOUZE
18	49281001	BREAK	1955	12	n	SAINT-GEORGES-DES-GARDES
19	49281001	BREAK	1971	4	n	SAINT-GEORGES-DES-GARDES
20	49281001	BREAK	1977	8	n	SAINT-GEORGES-DES-GARDES
21	49281001	BREAK	1985	8	n	SAINT-GEORGES-DES-GARDES
22	49281001	BREAK	2000	12	n	SAINT-GEORGES-DES-GARDES
23	49281001	BREAK	2002	2	n	SAINT-GEORGES-DES-GARDES
24	53094001	BREAK	1962	9	n	LAVAL-ENTRAMMES
25	53094001	BREAK	1973	12	n	LAVAL-ENTRAMMES

Line inserted using (b)

```
Your choice    : e
```

Create data files
Create station file
GRAB METADATA!

↓

CLIMATOL Checks

Fast QC

↓

Pairwise detection + joint detection

First guess of changes on input data (use also metadata)

↓

Correction

ACMANT detection (input data)

Correction

Pairwise detection + joint detection on corrected data

Improved guess of changes (use also metadata)

Correction
ACMANT Detection on input data

Assess month of change

Correction + pairwise detection on corrected data

Warning

Avoid validate very close change-points

Assess month of change only in the end of the process

Recommendations

- Use QCed data
- Use metadata
- Do not hesitate to get rid of poor series
- Ensure all data periods are non missing in several series

Control your *nnnnnn*detected.txt

close change-points are not recommended

Citing HOMER+Licence

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HOMER has no dedicated publication yet, and combines different published methods (PRODIGE, ACMANT, CLIMATOL) that gave good results during COST Action ES0601, alltogether with "cghseg" package , that you shall cite:

Caussinus H. and Mestre O. (2004) Detection and correction of artificial shifts in climate series. *Applied Statistics*, **53**, part 3, 405-425.

Domonkos P., R. Poza, and D. Efthymiadis (2011) Newest development of ACMANT. *dv. Sci. Res.*, 6, 7-11, 2011. doi:10.5194/asr-6-7-2011

Picard F., Lebarbier, E., Hoebeke, M., Rigaill, G., Thiam B. and Robin S. (2011). Joint segmentation, calling, and normalization of multiple CGH profiles. *Biostatistics*. doi:10.1093/biostatistics/kxq076

Guijarro J.A. (2011): User's guide to Climatol, 40 pp. http://www.meteobal.com/climatol/climatol-guide.pdf

Bug report

Report bugs to "olivier.mestre@meteo.fr"