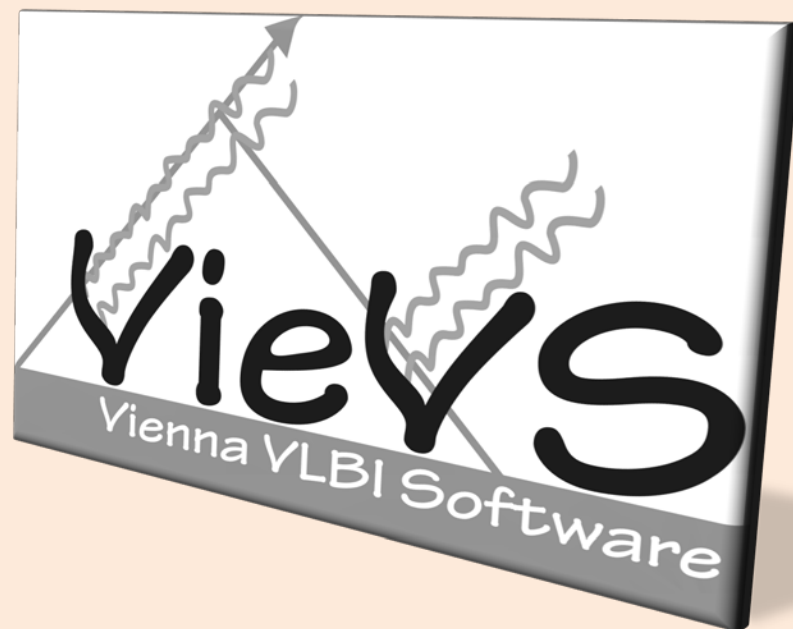


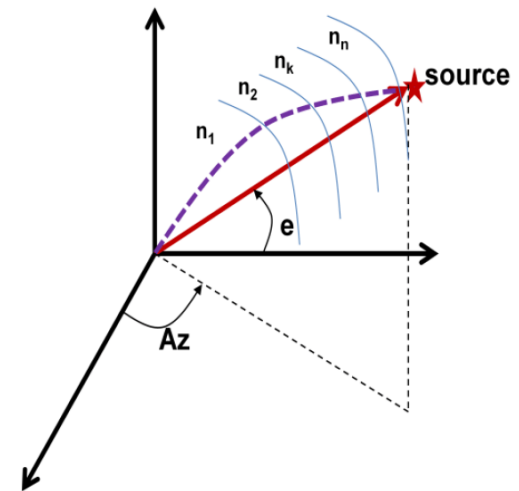
## External tropospheric files in VieVS

Armin Hofmeister, Daniel Landskron,  
Matthias Madzak



# External tropospheric files

- Tropospheric delays in one txt-file per session
- Different models available
- Easy exchangeability
- Use of own data possible

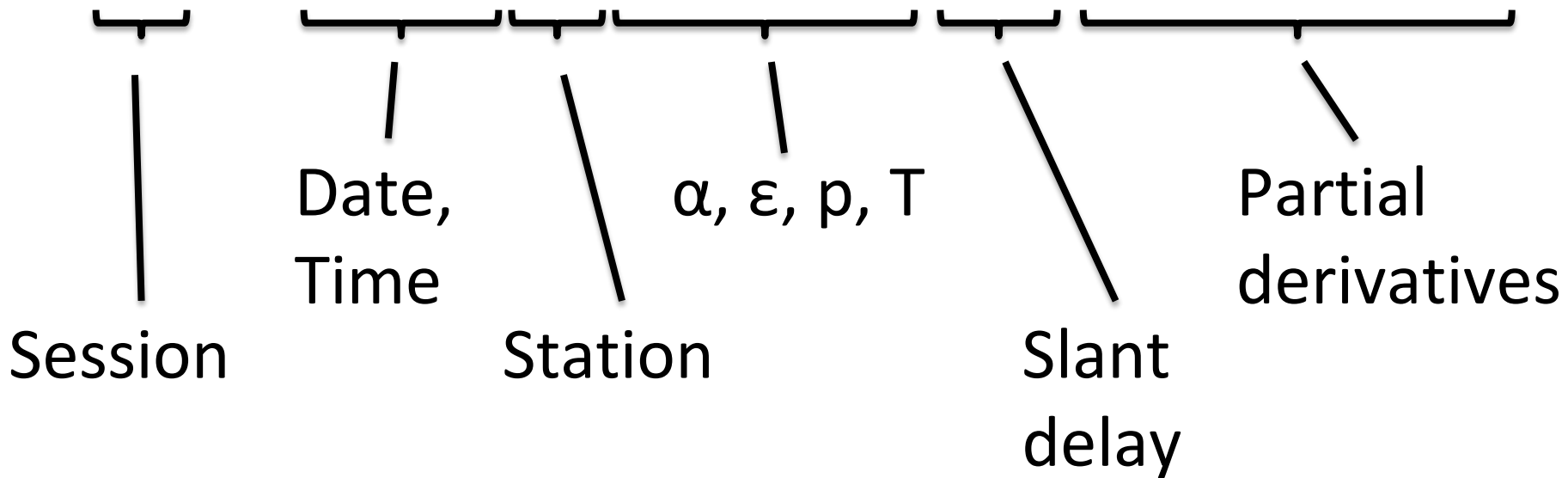


# Content of .trp files

```

0 $08AUG12XA      1 2008.08.12-00:00:10.0  TSUKUB32 267.22217 32.83763 1010.5 27.9 1.5683274e-008 1.8414883e+000 -1.3806082e-001 -2.8454188e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  WETTZELL 96.94537 28.11146 935.5 15.9 1.6181319e-008 2.1182503e+000 -4.7833716e-001 3.9266933e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  SVETLOE 119.17749 33.90588 1007.4 18.6 1.4284168e-008 1.7906143e+000 -1.2967475e+000 2.3223981e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  ZELENCHK 118.82887 48.42118 879.5 20.8 9.5710644e-009 1.3362900e+000 -5.7132658e-001 1.0380001e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  ONSALA60 100.33880 26.30473 1001.2 17.0 1.8172618e-008 2.2514722e+000 -8.1515716e-001 4.4683167e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  NYALES20 109.44378 20.67074 995.0 2.5 2.1822288e-008 2.8224172e+000 -2.4786993e+000 7.0215197e+000
0 $08AUG12XA      1 2008.08.12-00:00:10.0  HARTRAO 55.17440 24.48236 868.7 4.0 1.6270544e-008 2.4080215e+000 3.0087907e+000 4.3249582e+000
0 $08AUG12XA      2 2008.08.12-00:00:13.0  KOKEE 125.41518 34.88015 890.5 19.3 1.2221656e-008 1.7470804e+000 -1.4499862e+000 2.0391843e+000
0 $08AUG12XA      2 2008.08.12-00:00:13.0  WESTFORD 227.33333 20.86067 994.7 16.3 2.2472779e-008 2.7978737e+000 -4.9525056e+000 -5.3732464e+000
0 $08AUG12XA      3 2008.08.12-00:02:27.0  TSUKUB32 308.05014 33.90338 1010.5 27.9 1.5248142e-008 1.7904042e+000 1.6395823e+000 -2.0947886e+000
0 $08AUG12XA      3 2008.08.12-00:02:27.0  WETTZELL 72.72024 57.42382 935.4 16.1 9.0816080e-009 1.1864304e+000 2.2510831e-001 7.2363974e-001
0 $08AUG12XA      3 2008.08.12-00:02:27.0  SVETLOE 108.61745 67.22917 1007.4 18.6 8.6632933e-009 1.0844289e+000 -1.4530395e-001 4.3132740e-001
0 $08AUG12XA      3 2008.08.12-00:02:27.0  ZELENCHK 67.01852 74.60076 879.5 20.8 7.4324686e-009 1.0371982e+000 1.1153176e-001 2.6298863e-001
0 $08AUG12XA      3 2008.08.12-00:02:27.0  ONSALA60 85.11058 58.45999 1001.2 17.1 9.4904133e-009 1.1730831e+000 6.1351386e-002 7.1718921e-001

```



# Steps

## 1. Tropospheric parameter file

→ What models to be used ?

## 2. External tropospheric file (.trp)

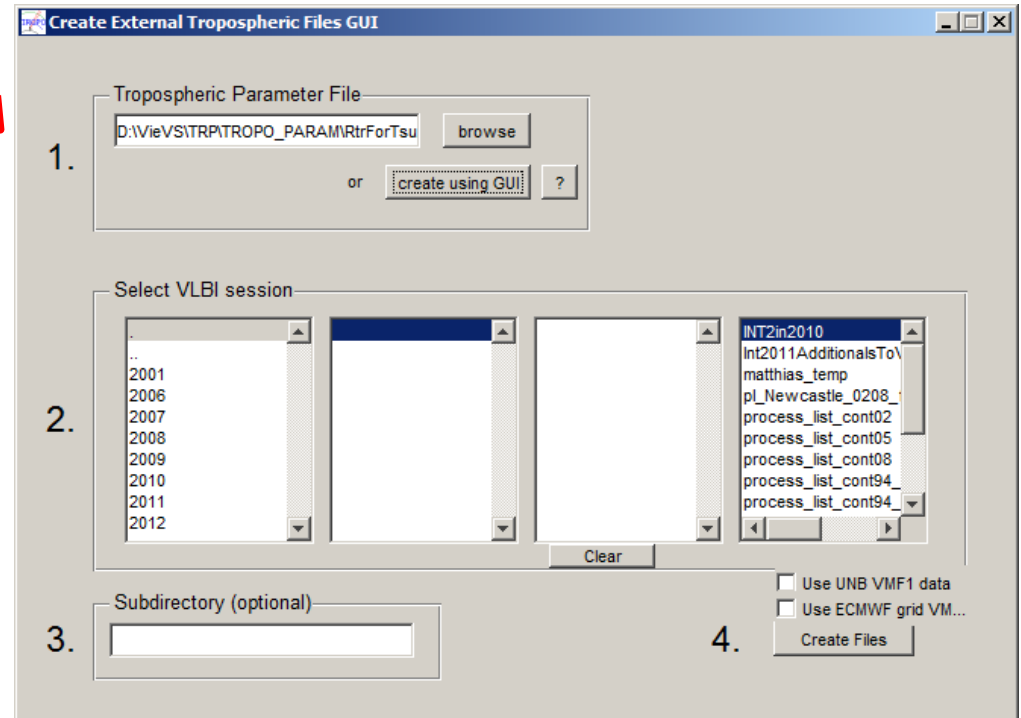
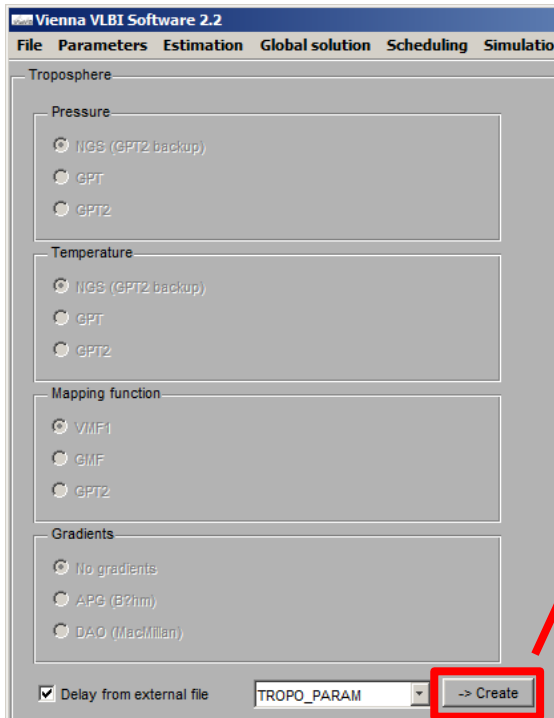
→ For which session(s) ?

## 3. Usage in VieVS

→ Process session(s)

# Start program

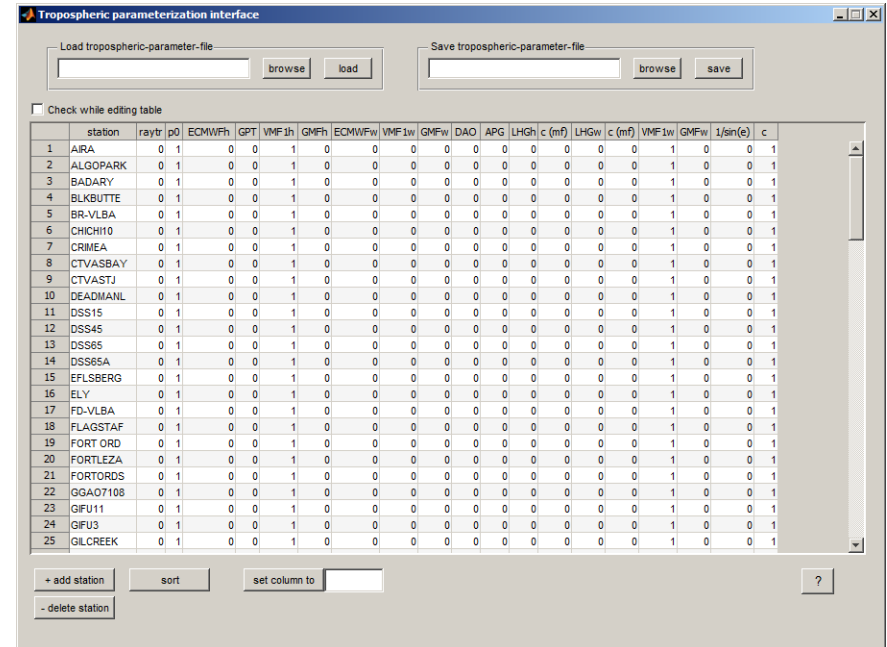
- VieVS 2.2: Parameters → Troposphere
- Click „Create“



# Tropospheric parameter file (1)

- Created via GUI
- Defines models for all stations
- Click „create using GUI“

or run *TRP\PROGRAM\GUI\createTropoParameterFilesGUI.m*



# Tropospheric parameter file (2)

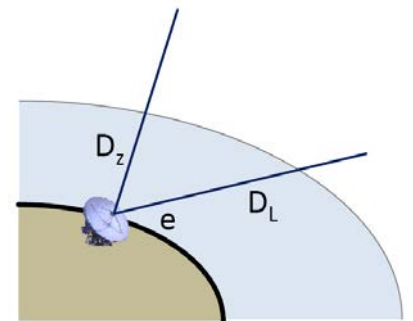
- Set (different) tropospheric models for each station (1 | 0)
- Save textfile

The screenshot shows the 'Tropospheric parameterization interface' window. It features a table with 25 rows and 20 columns. The columns are labeled: station, raytr, p0, ECMWFh, GPT, VMF1h, GMFh, ECMWFw, VMF1w, GMFw, DAO, APG, LHCl, c (mf), LHGw, c (mf), VMF1w, GMFw, 1/sin(e), and c. The table contains numerical values for each parameter for each station. At the top, there are fields for 'Load tropospheric-parameter-file' and 'Save tropospheric-parameter-file', each with 'browse' and 'load'/'save' buttons. A 'Check while editing table' checkbox is also present. At the bottom, there are buttons for '+ add station', 'sort', 'set column to', and '- delete station', along with a help icon.

	station	raytr	p0	ECMWFh	GPT	VMF1h	GMFh	ECMWFw	VMF1w	GMFw	DAO	APG	LHCl	c (mf)	LHGw	c (mf)	VMF1w	GMFw	1/sin(e)	c
1	AIRA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
2	ALGOPARK	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
3	BADARY	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
4	BLKBUTTE	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5	BR-VLBA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
6	CHICH10	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7	CRIMEA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8	CTVASBAY	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
9	CTVASTJ	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
10	DEADMANL	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
11	DSS15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
12	DSS45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
13	DSS65	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
14	DSS65A	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
15	EFLSBERG	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
16	ELY	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
17	FD-VLBA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
18	FLAGSTAF	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
19	FORT ORD	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
20	FORTLEZA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
21	FORTORDS	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
22	GGA07108	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
23	GIFU11	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
24	GIFU3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
25	GILCREEK	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1

# Models for tropospheric files

- Delay
  - ECMWF (h/w)
  - Surface pressure
  - Global Pressure and Temperature
- Mapping Functions
  - VMF1
  - GMF
- Gradients
  - LHG
  - DAO
  - APG

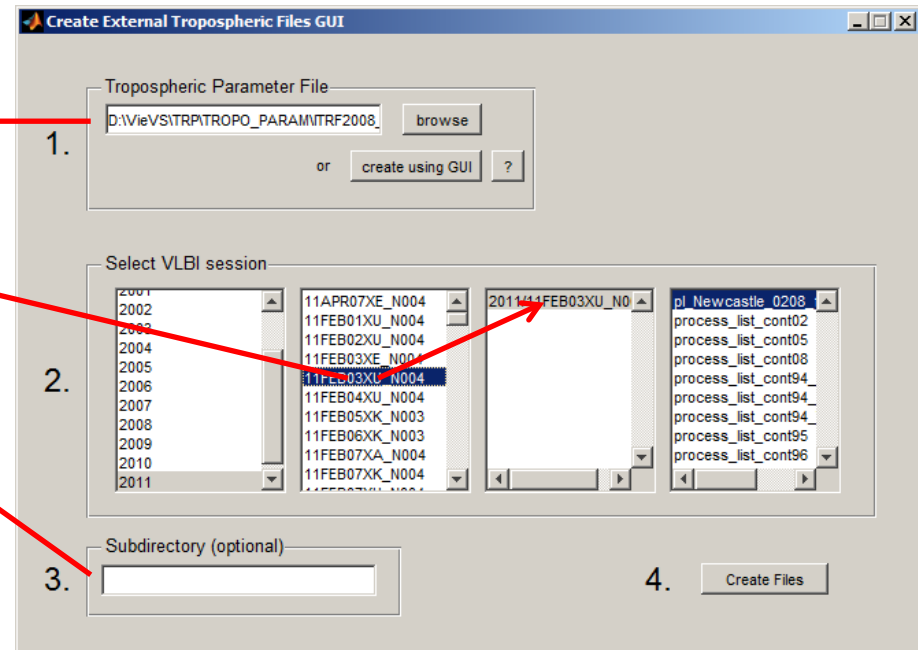




# External tropospheric files

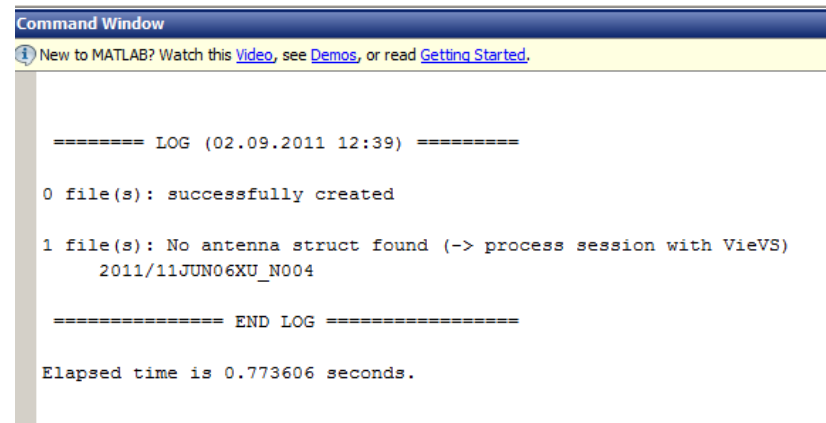
1. Define (just created) parameter file
2. Select sessions
3. Choose subfolder
4. Click „Create“

→ \TRP [\subfolder] \\*.trp



# Note

- Session must be processed before once
- Read log (Command Window) for information



```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.

===== LOG (02.09.2011 12:39) =====

0 file(s): successfully created

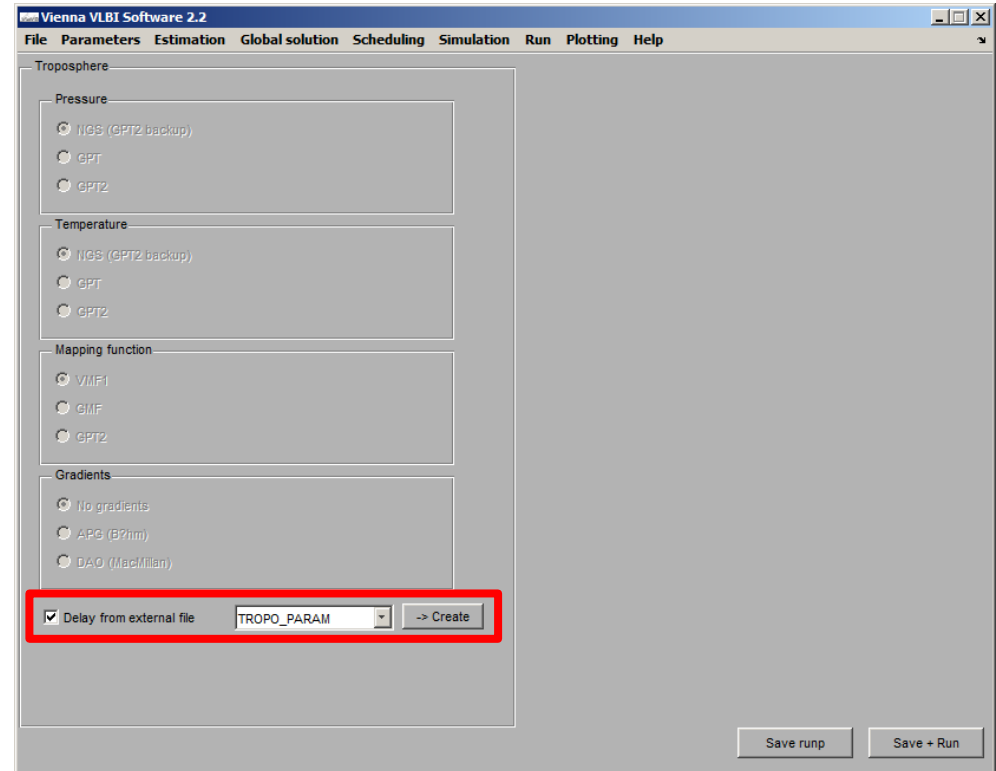
1 file(s): No antenna struct found (-> process session with VieVS)
          2011/11JUN06XU_N004

===== END LOG =====

Elapsed time is 0.773606 seconds.
```

# Use files in VieVS

- GUI Parameters-Troposphere
- Click „External file“
- Select subfolder (if chosen)
- Delays are applied



# Ray-tracing in VieVS

- Possible to use ray-traced delays
- Set parameter „raytr“ in the tropospheric parameter file
- → external tropospheric files contain slant path delays retrieved from ray-tracing results (.rtr-files for each session necessary)