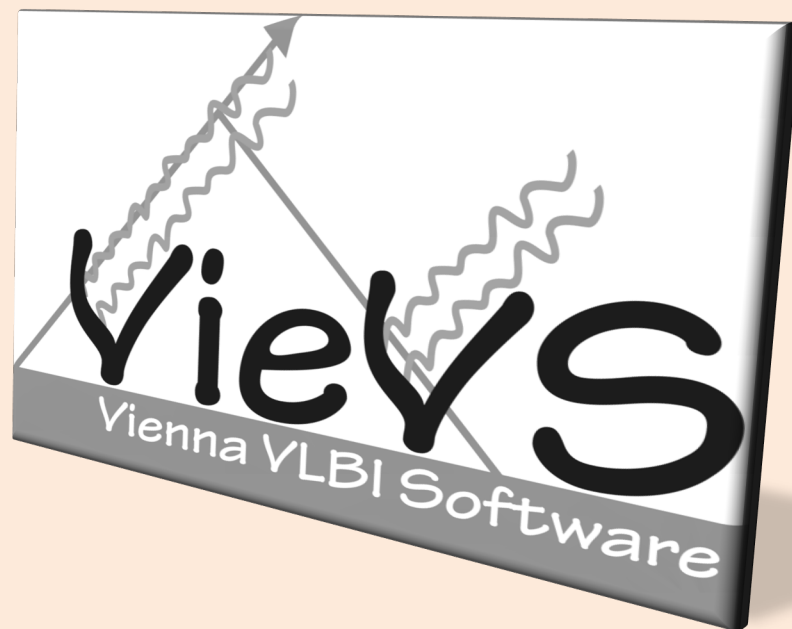


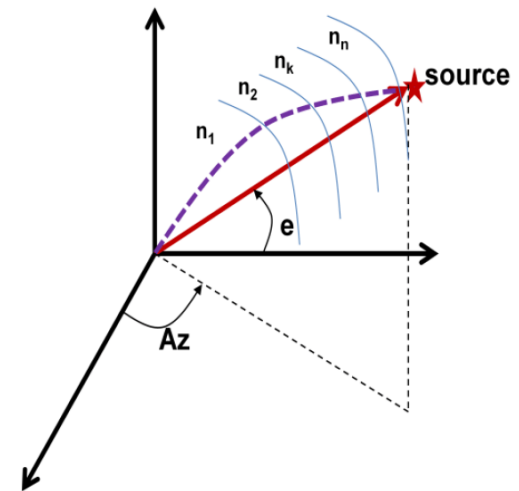
# External tropospheric files in VieVS

Armin Hofmeister, Daniel Landskron



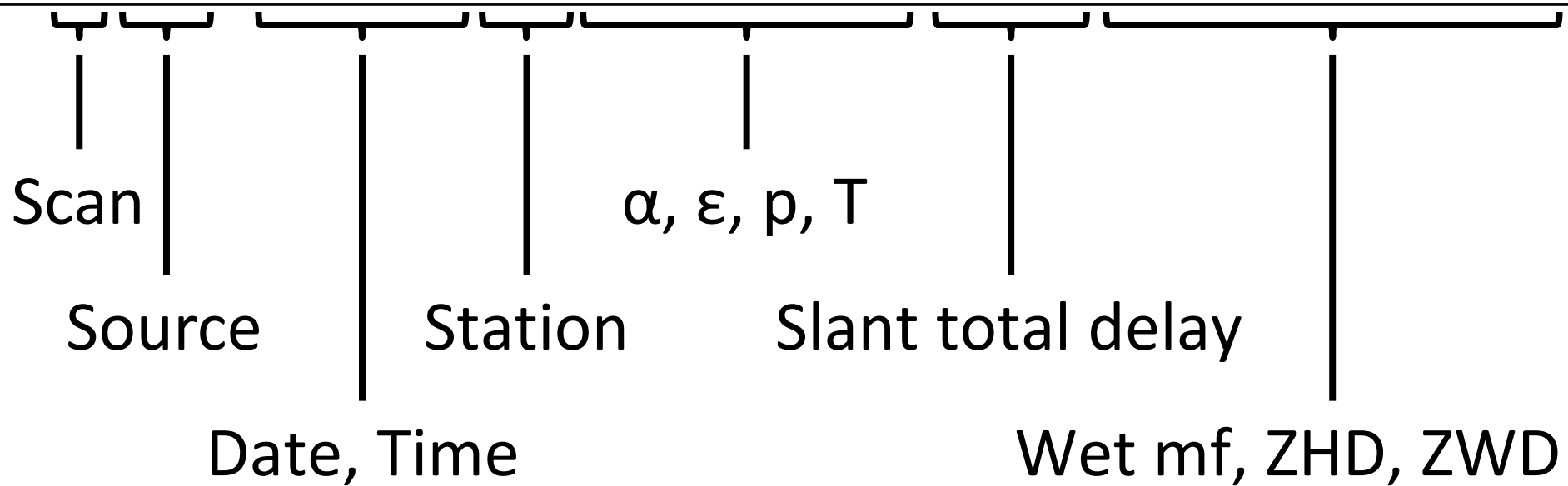
# External tropospheric files

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



# Content of .trp files

#	Scan	Source	Time tag in TAI [yyyy.mm.dd-hh:mm:ss.s]	Site	Azimuth [°]	Elev. [°]	Pres. [hPa]	Temp. [°C]	std [s]	Wet mf	zhd [s]	zwd [s]
0	1	OJ287	2011.09.15-00:00:10.0	KOKEE	279.85783	34.24406	891.6	19.9	1.2691773e-08	1.7752472e+00	6.7864245e-09	3.7392598e-10
0	1	OJ287	2011.09.15-00:00:10.0	TSUKUB32	179.56687	73.95947	1013.9	29.0	8.6665565e-09	1.0404637e+00	7.7065996e-09	6.2337616e-10
0	1	OJ287	2011.09.15-00:00:10.0	NYALES20	49.11510	12.98904	991.2	3.0	3.4298260e-08	4.4020169e+00	7.5094375e-09	3.6559357e-10
0	1	OJ287	2011.09.15-00:00:10.0	HOBART12	352.39908	26.77998	1005.4	11.9	1.7414068e-08	2.2149173e+00	7.6372412e-09	2.4553937e-10
0	2	2227-088	2011.09.15-00:00:20.0	FORTLEZA	102.80297	67.35481	1008.9	26.6	9.1083828e-09	1.0834275e+00	7.6823258e-09	7.2563059e-10
0	2	2227-088	2011.09.15-00:00:20.0	YEBES40M	196.80668	39.53740	913.0	20.2	1.1505402e-08	1.5696625e+00	6.9387276e-09	3.9831261e-10
0	2	2227-088	2011.09.15-00:00:20.0	HARTRAO	284.64962	44.96023	865.1	9.8	9.6235816e-09	1.4145708e+00	6.5835225e-09	2.2482794e-10
0	2	2227-088	2011.09.15-00:00:20.0	TIGOCONC	76.05727	31.37413	1000.1	10.1	1.4903109e-08	1.9177942e+00	7.6013916e-09	1.8280534e-10
0	2	2227-088	2011.09.15-00:00:20.0	WETTZELL	212.55825	27.02022	949.3	10.0	1.6239880e-08	2.1968827e+00	7.2081286e-09	2.0381803e-10
0	2	2227-088	2011.09.15-00:00:20.0	ZELENCHK	240.52511	16.23784	890.6	11.0	2.4855278e-08	3.5550089e+00	6.7667281e-09	2.7984107e-10
0	2	2227-088	2011.09.15-00:00:20.0	ONSALA60	209.71030	20.24741	1002.8	12.3	2.2542514e-08	2.8795229e+00	7.6074940e-09	2.6165695e-10
0	2	2227-088	2011.09.15-00:00:20.0	WESTFORD	121.00033	18.28085	999.8	23.6	2.5947126e-08	3.1723147e+00	7.5949352e-09	6.3175491e-10



# Steps

## 1. Tropospheric parameter file

→ Which models to be used?

## 2. External tropospheric file (.trp)

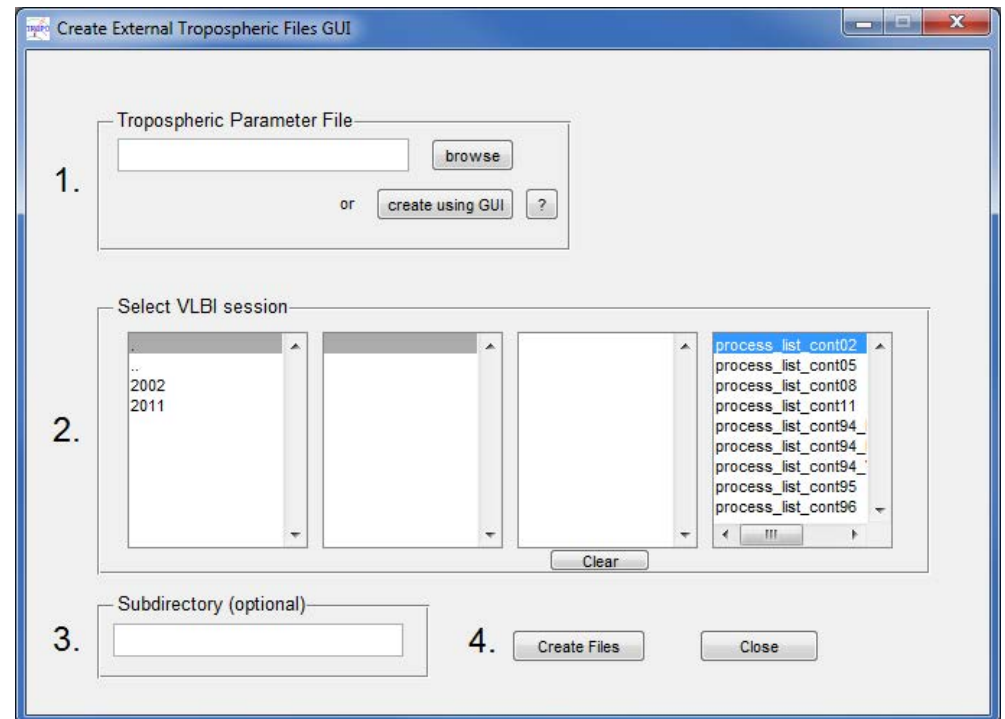
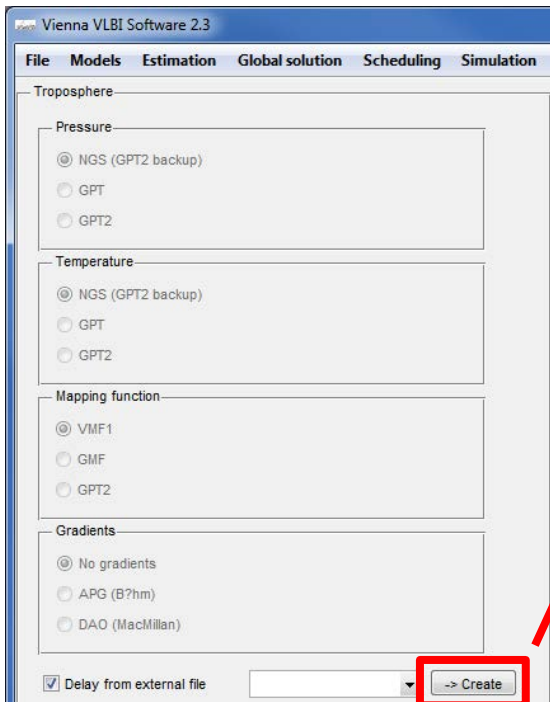
→ For which sessions?

## 3. Usage in VieVS

→ Process sessions

# Program start

- VieVS 2.3: Models → Troposphere
- Click „Create“



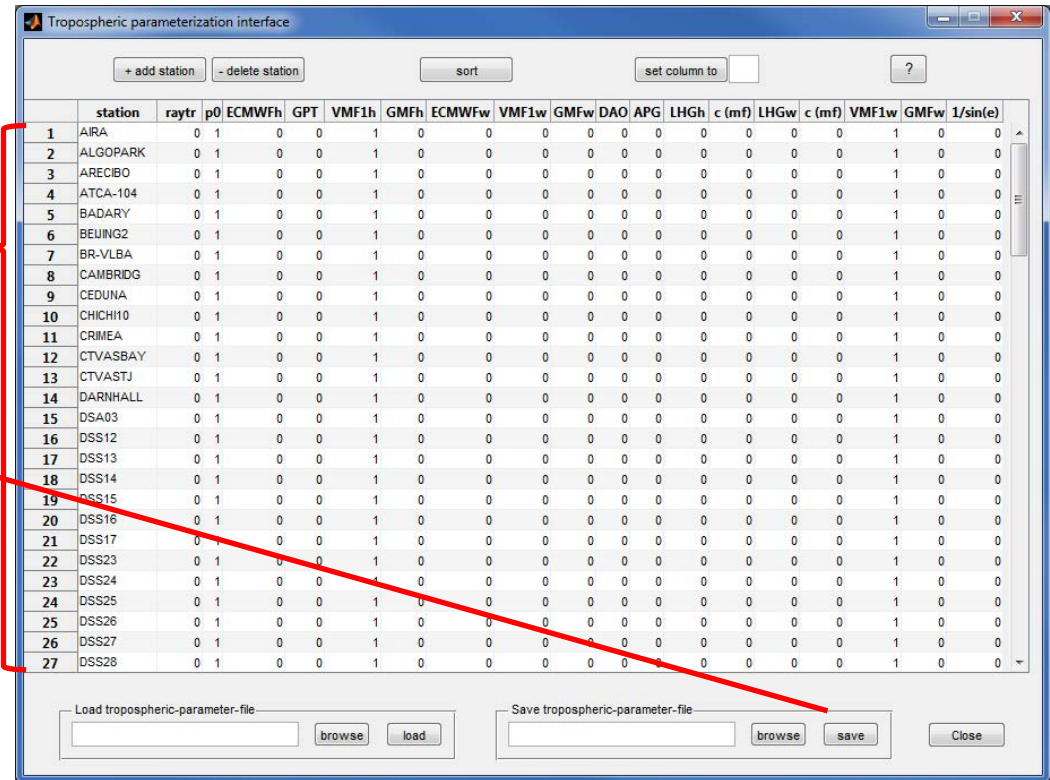
# Tropospheric parameter file (1)

- Created via GUI
- Defines models for all stations
- Click „create using GUI“  
or run *TRP\PROGRAM\GUI\createTropoParameterFilesGUI.m*

	station	raytr	p0	ECMWFh	GPT	VMF1h	GMFh	ECMWFw	VMF1w	GMFw	DAO	APG	LHGh	c (m)	LHGw	c (m)	VMF1w	GMFw	1/sin(e)
1	ARA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
2	ALGOPARK	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
3	ARECIBO	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
4	ATCA-104	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
5	BADARY	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
6	BEIJING2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
7	BR-VLBA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
8	CAMBRIDG	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
9	CEDUNA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
10	CHICH10	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
11	CRIMEA	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
12	CTVASBAY	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
13	CTVASTJ	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
14	DARINHALL	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
15	DSSA03	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
16	DSS12	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
17	DSS13	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
18	DSS14	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
19	DSS15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
20	DSS16	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
21	DSS17	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
22	DSS23	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
23	DSS24	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
24	DSS25	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
25	DSS26	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
26	DSS27	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
27	DSS28	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0

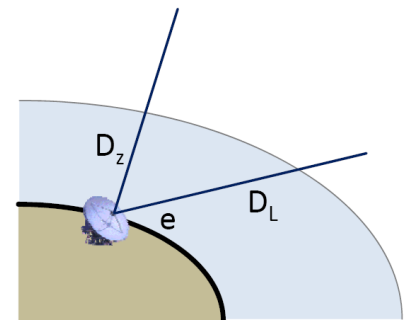
# Tropospheric parameter file (2)

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



# Models for tropospheric files

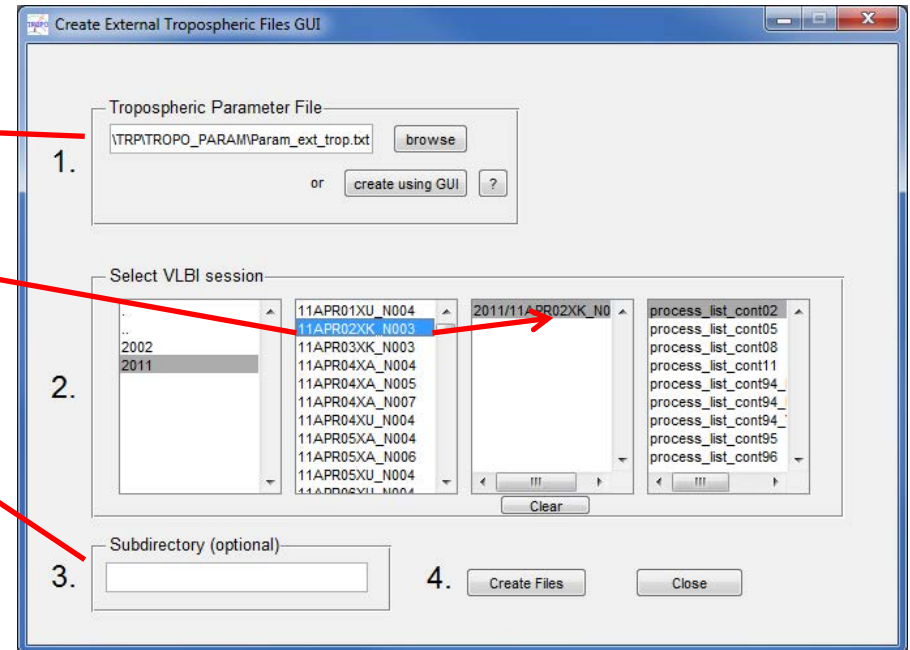
- Delay
  - ECMWF (h/w)
  - Surface pressure
  - Global Pressure and Temperature
- Mapping Functions
  - VMF1
  - GMF
- Gradients
  - LHG
  - DAO
  - APG





# External tropospheric files

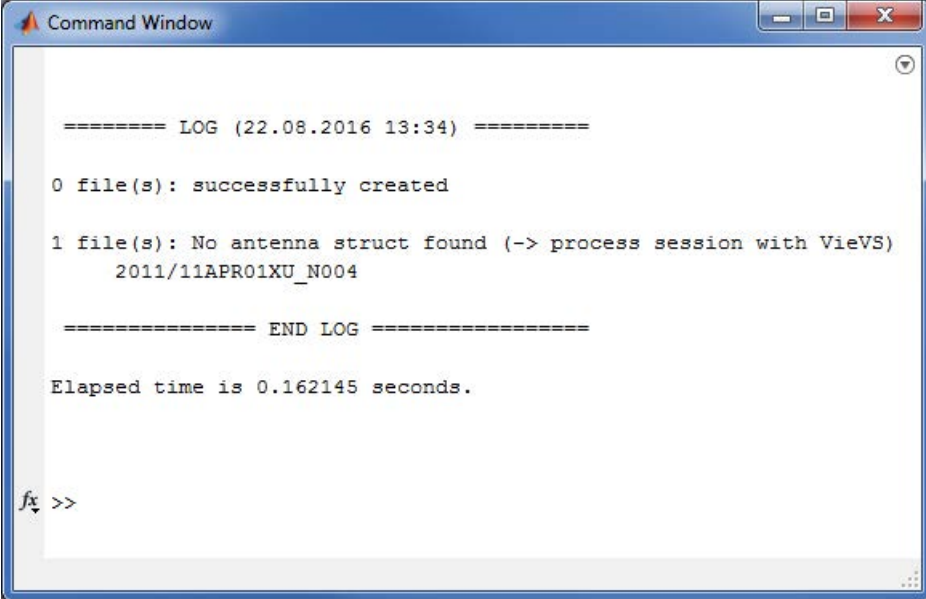
1. Define (just created) parameter file
2. Select sessions
3. Choose subfolder
4. Click „Create Files“



→ \TRP\OUTPUT\_DATA\  
[\subfolder]\\*.trp

# Note

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



```
Command Window

===== LOG (22.08.2016 13:34) =====

0 file(s): successfully created

1 file(s): No antenna struct found (-> process session with VieVS)
2011/11APR01XU_N004

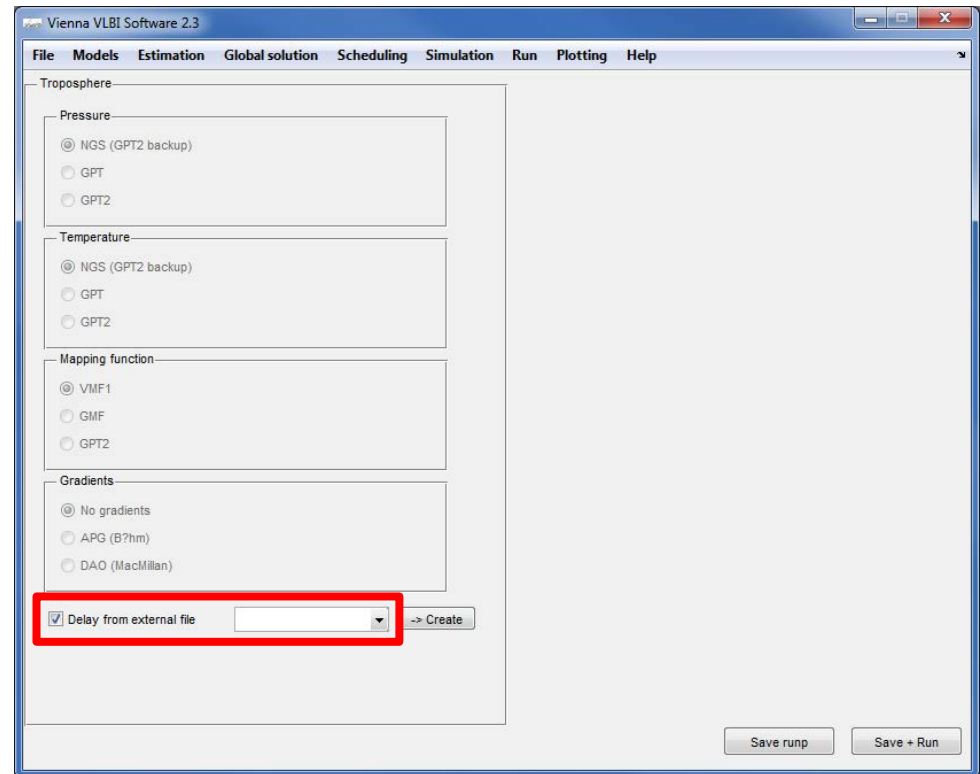
----- END LOG -----

Elapsed time is 0.162145 seconds.

fx >>
```

# Use files in VieVS

- GUI: Models → Troposphere
- Tick „Delay from external file“
- Select subfolder (if chosen)
- Delays from external files are applied



# Ray-traced delays 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 (.radiate-files for each session required)