TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

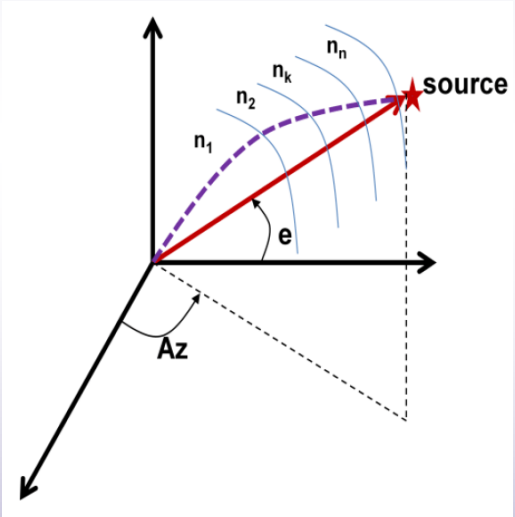
External tropospheric files in VieVS

Armin Hofmeister, Matthias Madzak

VieVS User Workshop
9 – 10 September, 2013
Vienna

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

Session

Date, Time

Station

α, ε, p, T

Slant delay

Partial derivatives

Steps

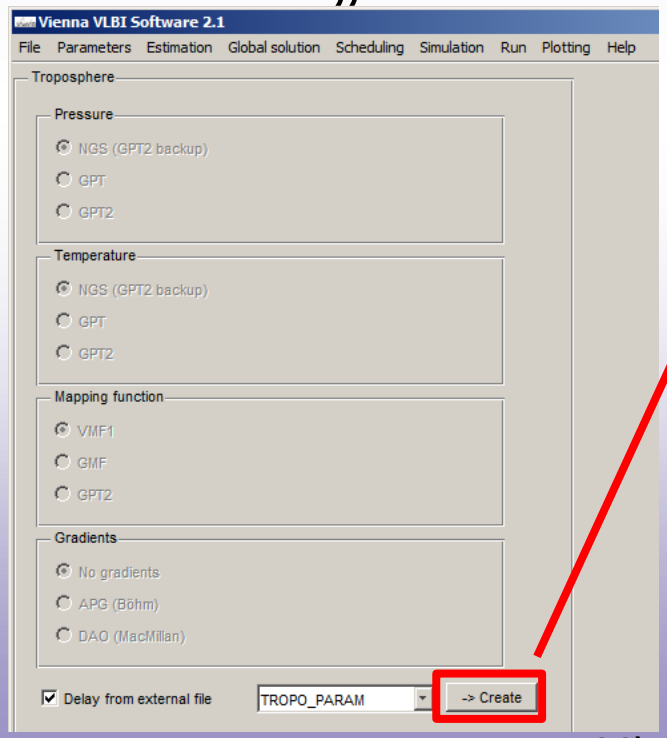
1. Tropospheric parameter file
   → What models to be used ?

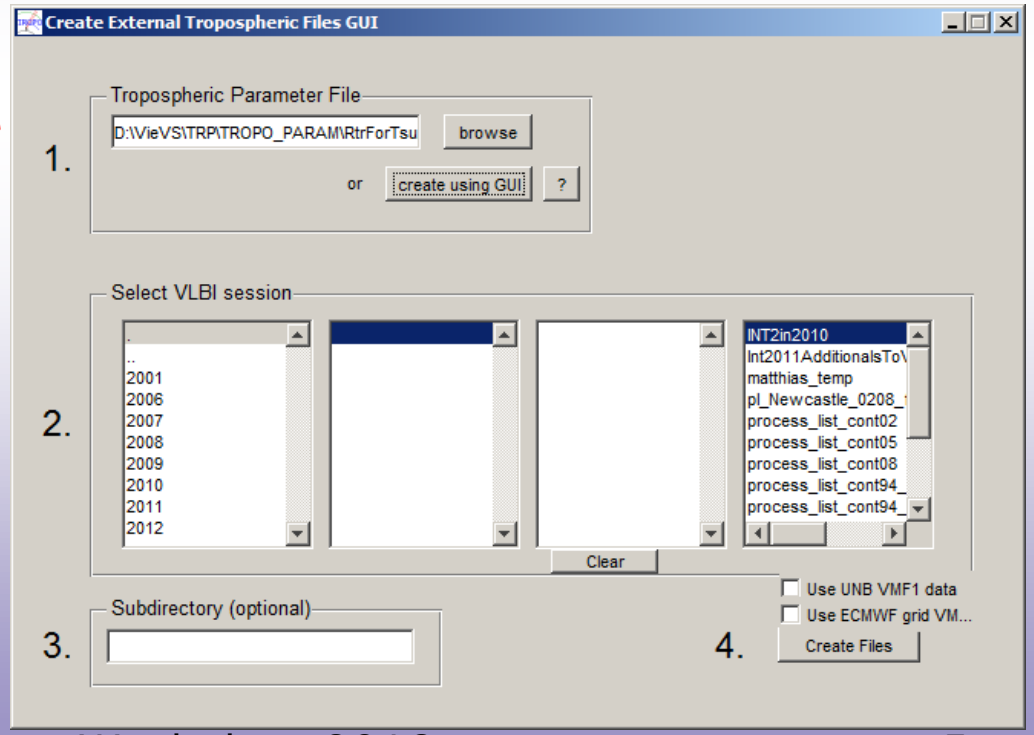
2. External troposheric file (.trp)
   → For which session(s) ?

3. Use in VieVS
   → Process session(s)

Start program

- VieVS 2.1: Parameters – Troposphere
- Click „Create“

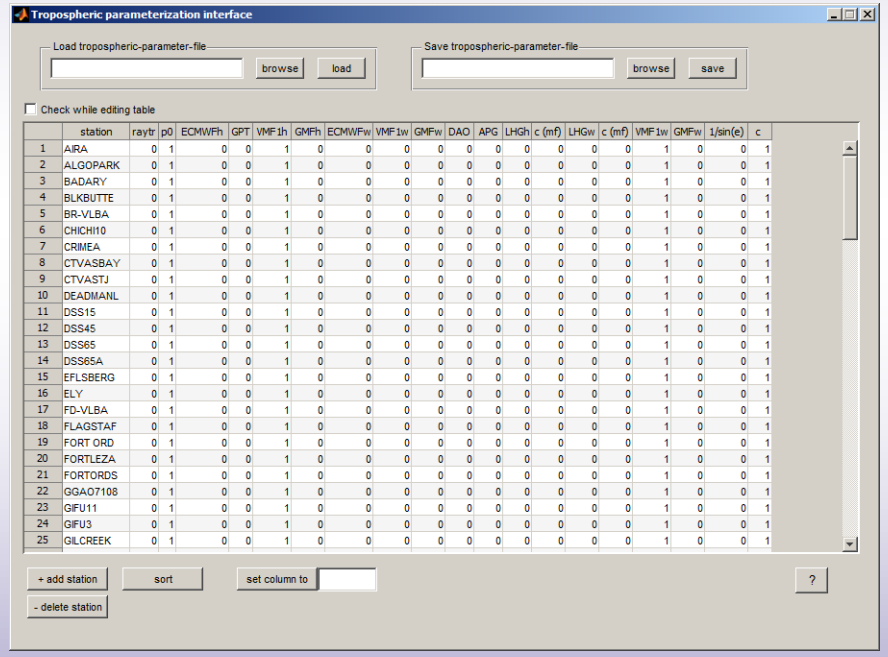




Tropospheric parameter file (1)

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

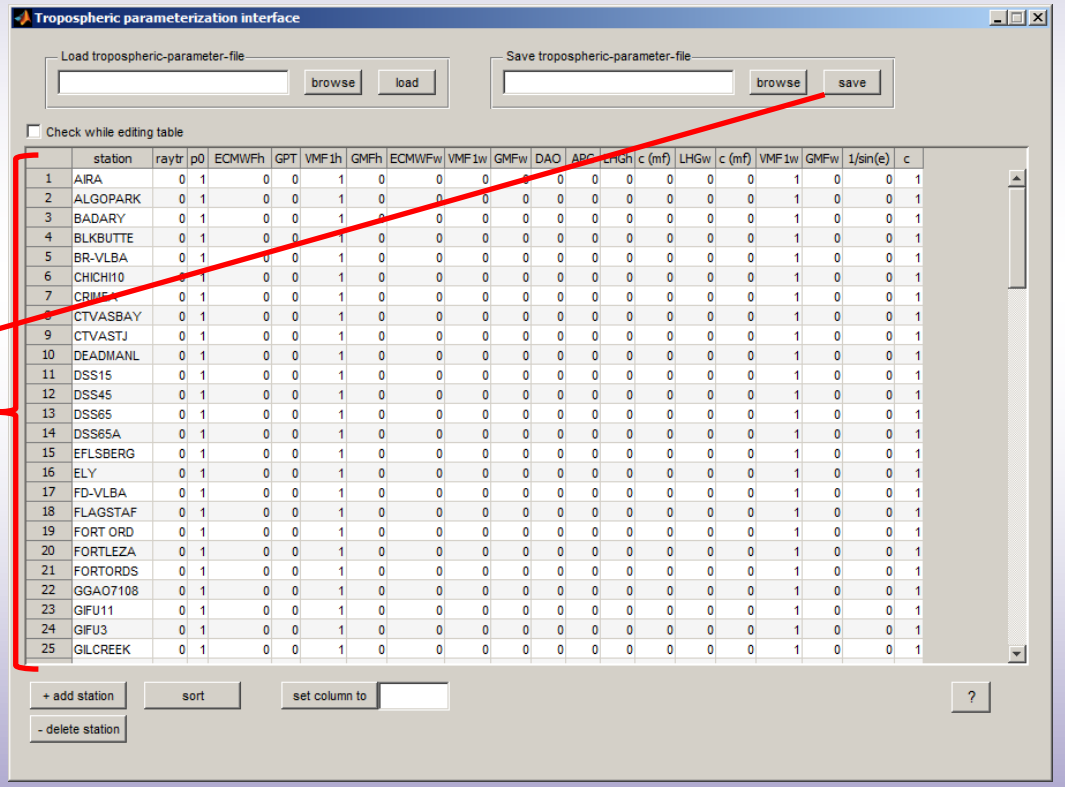
  or run *TRP\ PROGRAM\ GUI\ createTropoParameterFilesGUI.m*



	station	raytr	p0	ECMWFh	GPT	VMF1h	GMFh	ECMWFw	VMF1w	GMFw	DAO	APG	LHGh	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	CHICHI10	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	GGAO7108	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

Tropospheric parameter file (2)

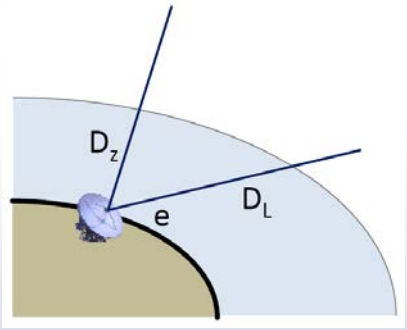
- Set tropospheric models for all stations (1 | 0)
- Save textfile



	station	raytr	p0	ECMWFh	GPT	VMF1h	GMFh	ECMWFw	VMF1w	GMFw	DAO	APG	LHGh	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	CHICHI10	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	GGAO7108	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

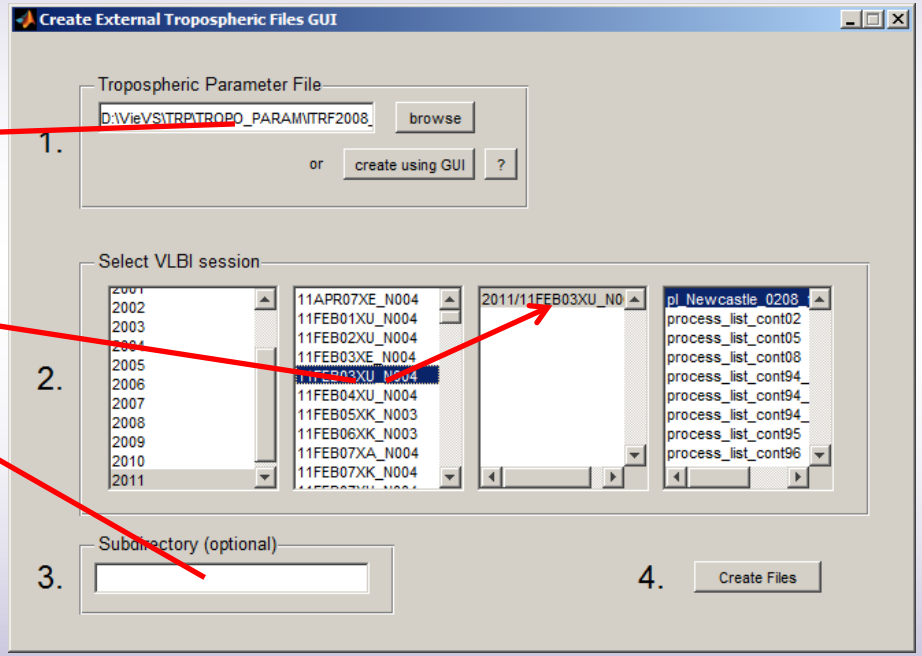
Models for tropospheric files

- Delay
  - ECMWF (h/w)
  - Surface pressure
  - Global Pressure and Temperature
- Partial derivatives
  - VMF1w
  - GMFw
- Mapping Functions
  - VMF1
  - GMF
- Gradients
  - LHG
  - DAO
  - APG



External tropospheric files

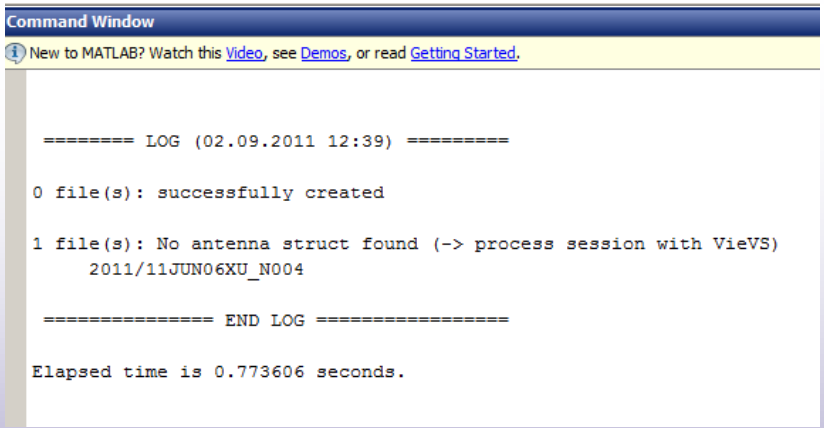
1. Define (just created) parameter file
2. Select stations
3. Choose subfolder
4. Click „Create“



→ \TRP [*subfolder*] *.trp

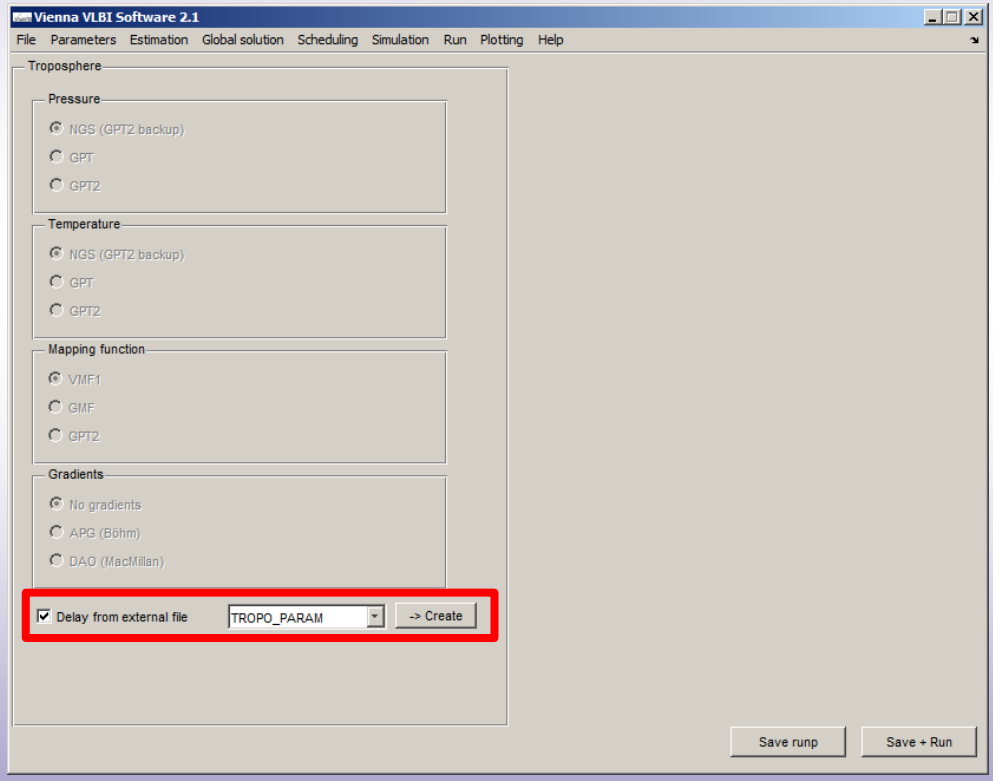
Note

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



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)