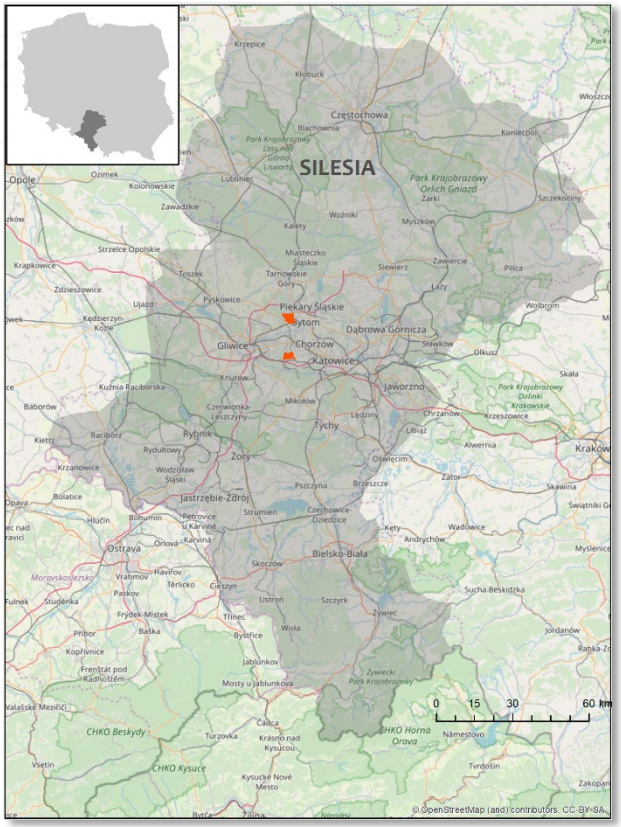
EPOS - System Obserwacji Płyty Europejskiej

Satellite radar remote sensing for geodynamic studies



Maya ILIEVA[1], Andrzej BORKOWSKI[1], Kamil SMOLAK[1], Witold ROHM[1]

Piotr GRUCHLIK[2], Piotr POLANIN[2], Andrzej KOWALSKI[2]

[1]Institute of Geodesy and Geoinformatics, WUELS, Wroclaw
[2]Department of Surface and Structures Protection, GIG, Katowice

28 March 2019, WUELS

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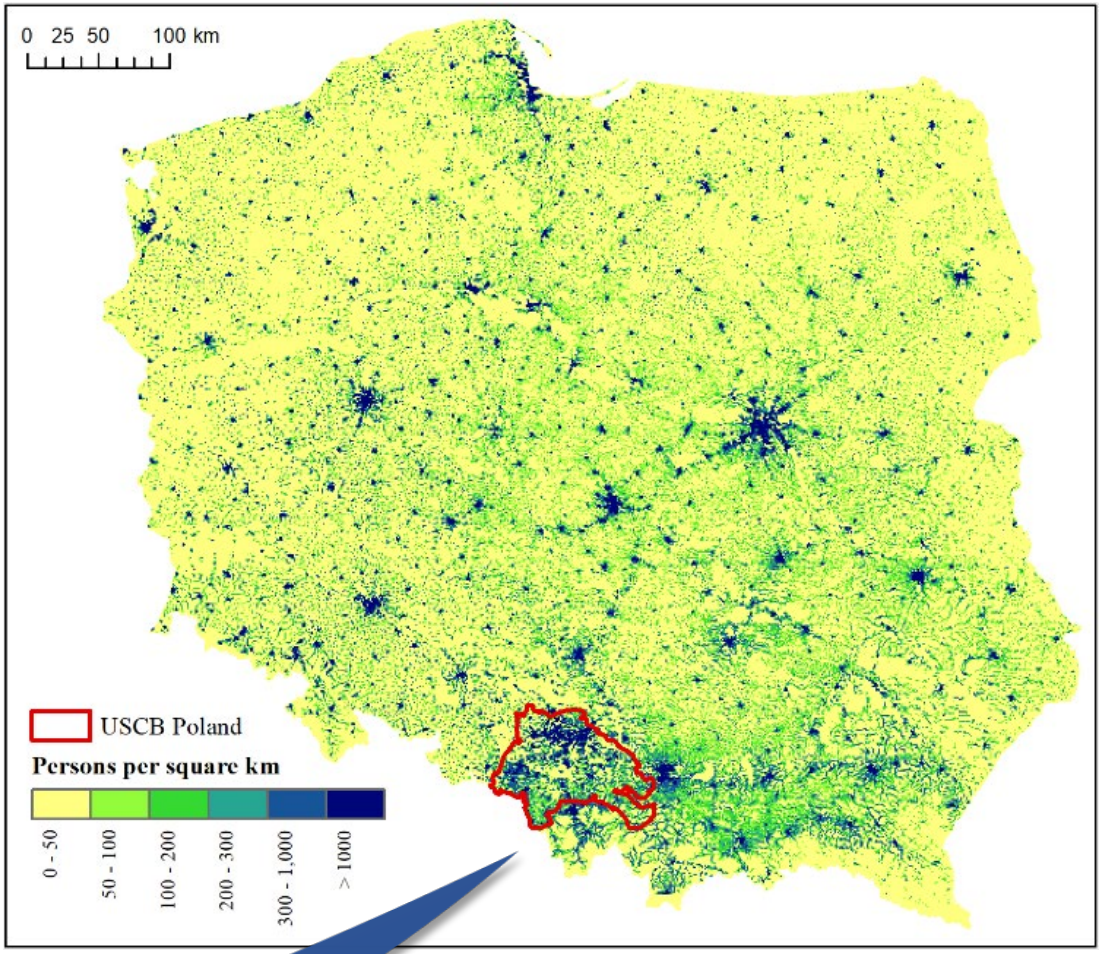
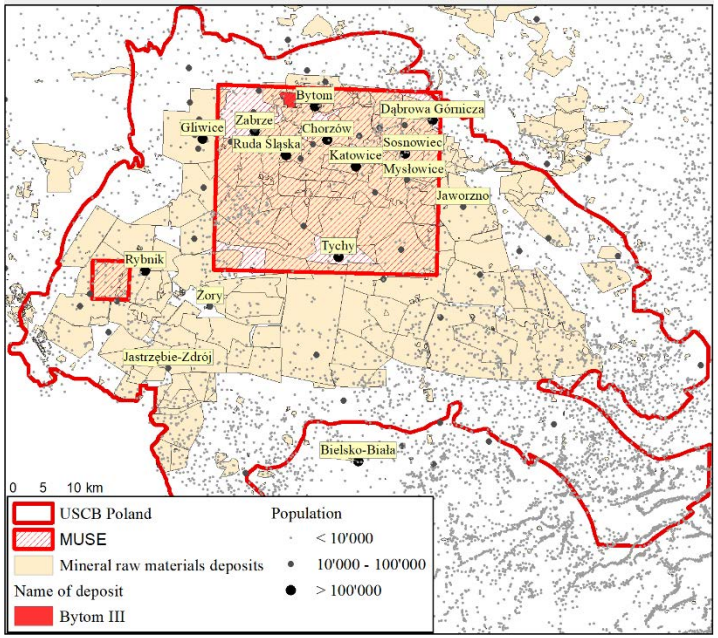
Motivation

- 4.5 mln inhabitants in Silesia
- **USCB** – Upper Silesian Coal Basin
- **MUSE –** Multidisciplinary Upper Silesian Episodes





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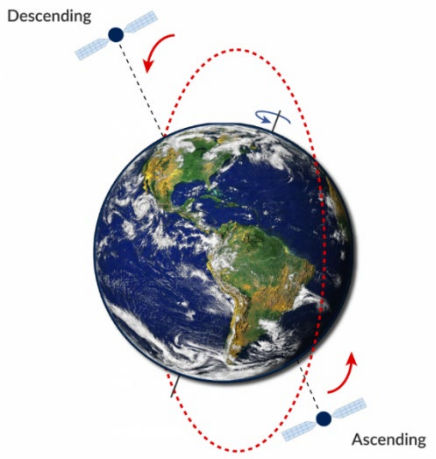
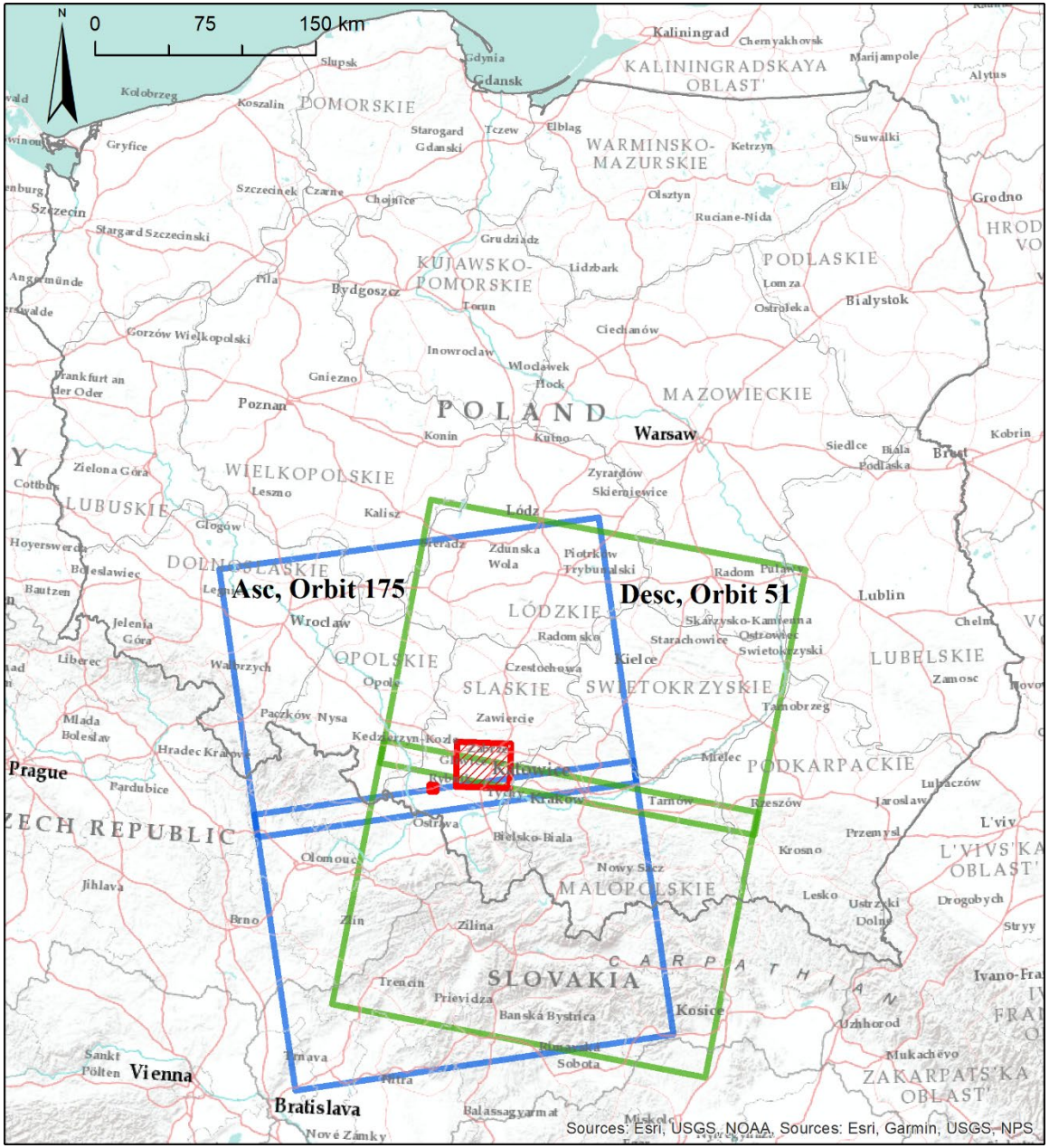
Sentinel-1 satellite image footprints



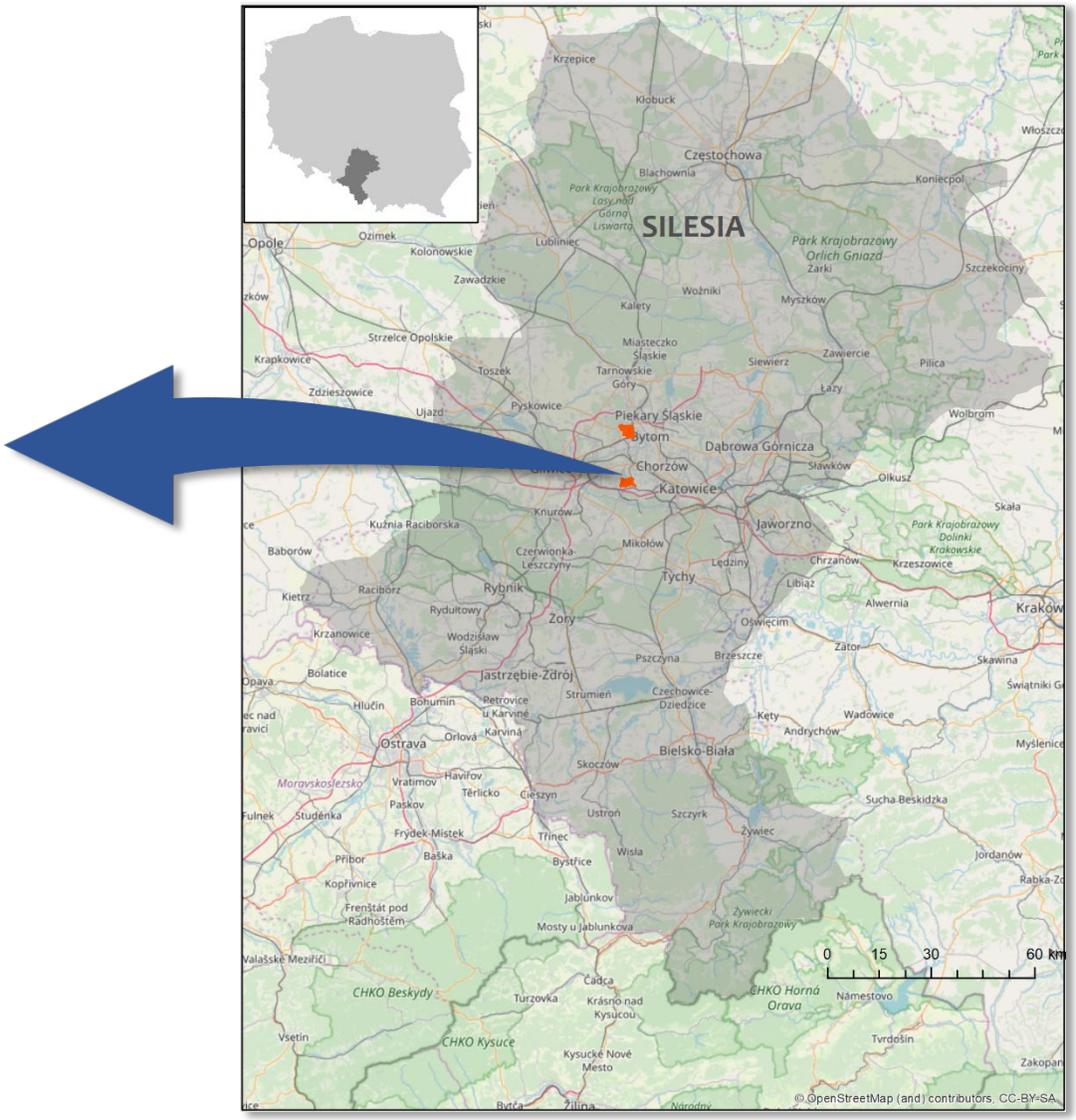
For DInSAR till now:

- **Ascending**: 61 images
  (…2017.01.04-2017.12.30…)
  60 interferograms
  60 maps of coherence

- **Descending**: 55 images
  (…2017.01.02-2017.12.28…)
  54 interferograms
  54 maps of coherence



Mine Wirek-II (Ruda Śląska)



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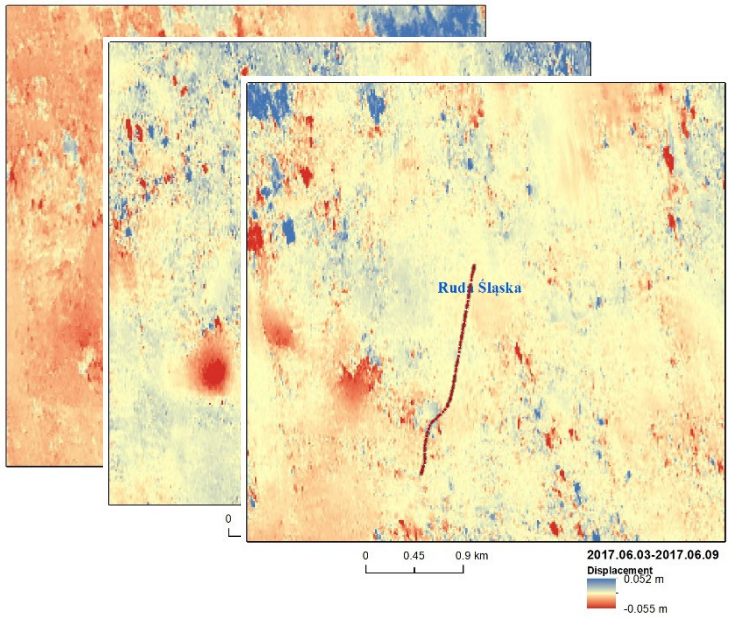
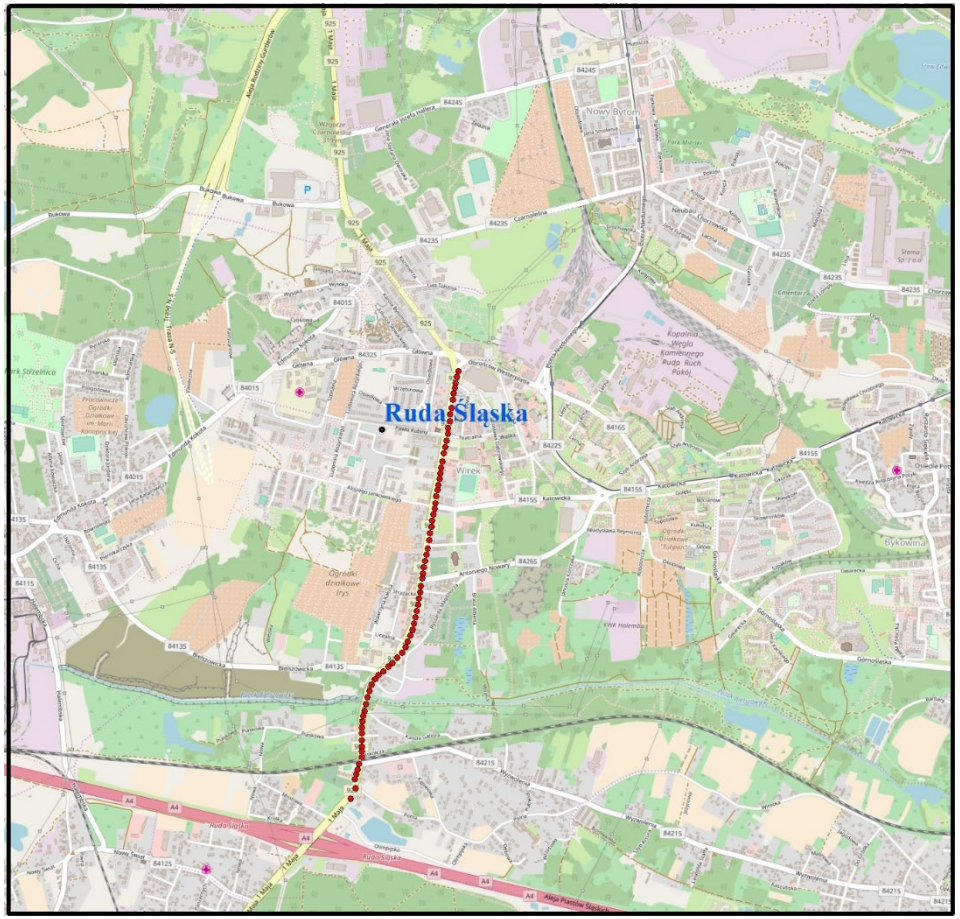
Validation - levelling





Levelling:

8 May 2017

7 June 2017

10 July 2017

1 Sept2017

24 Oct2017

12 Jan 2018

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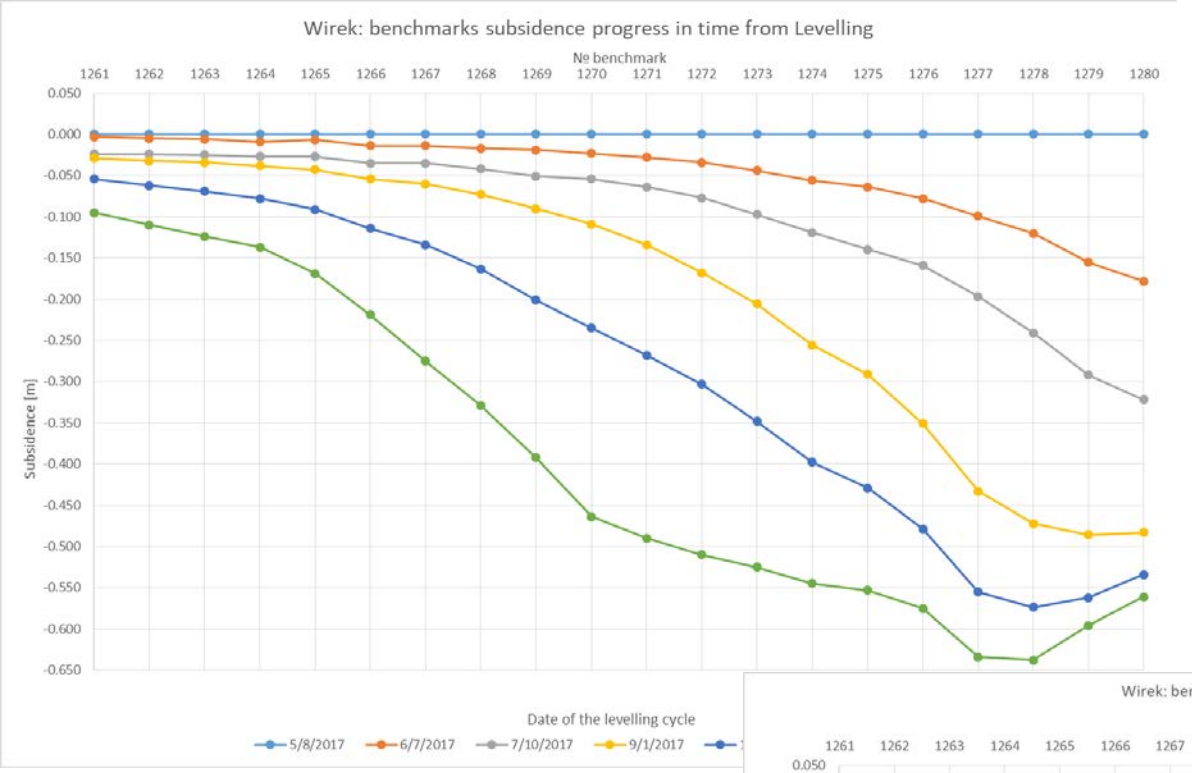
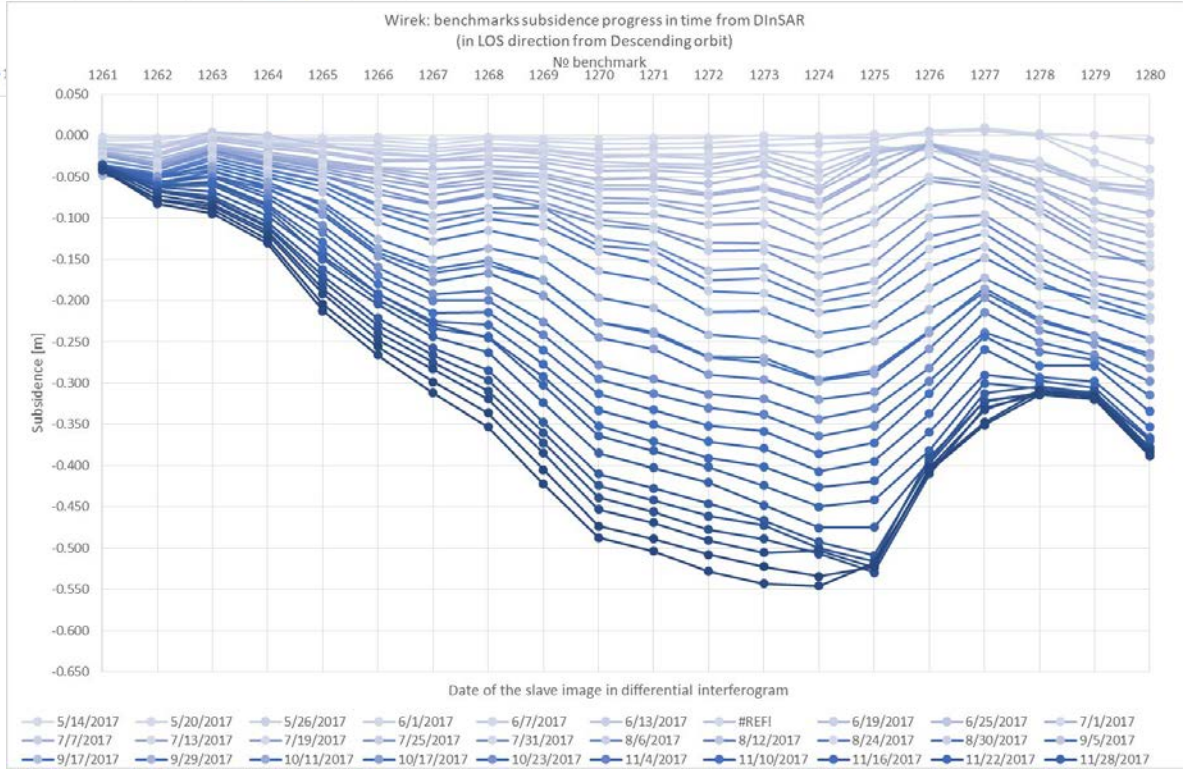


Levelling



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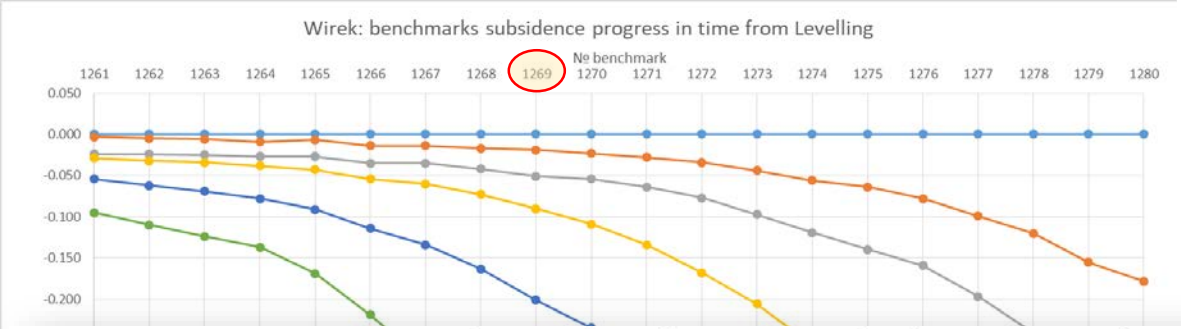

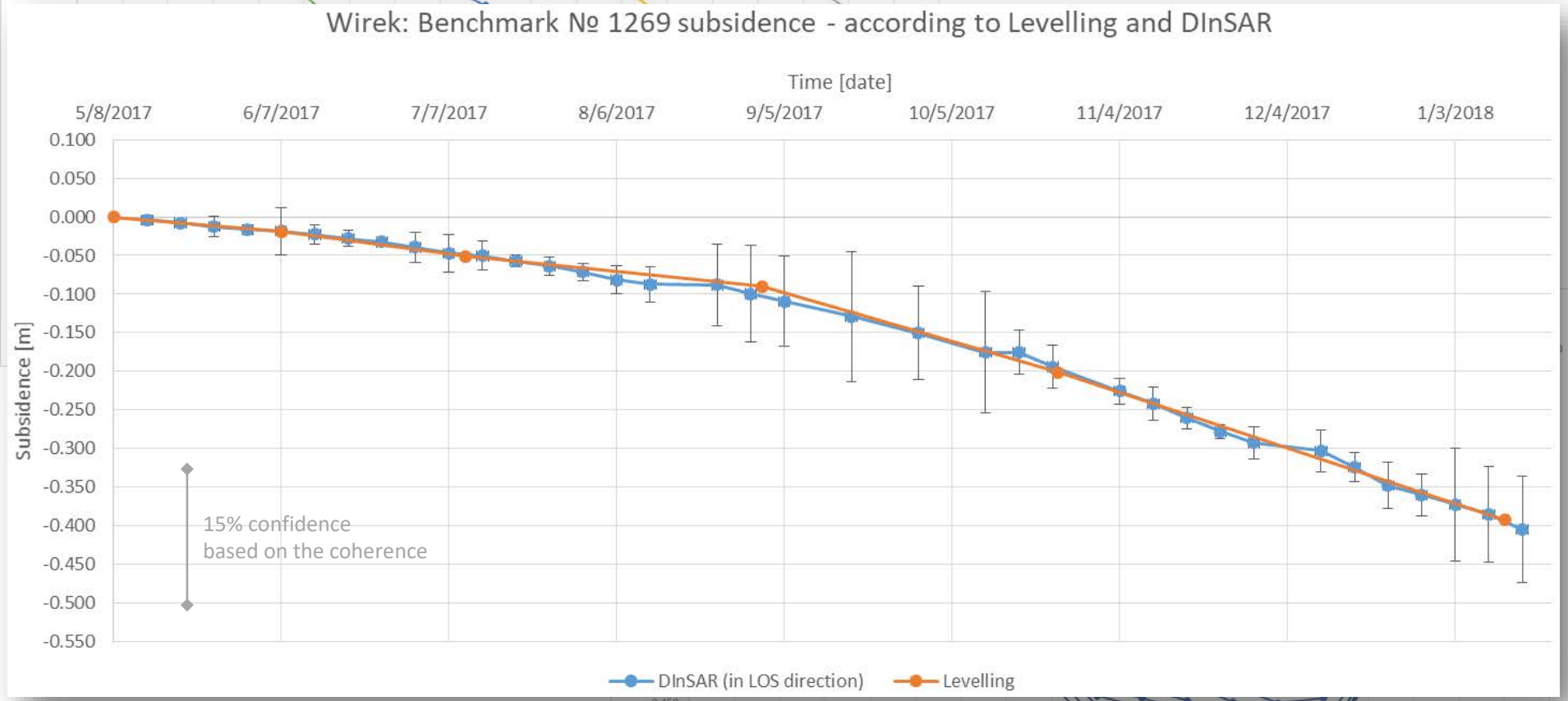

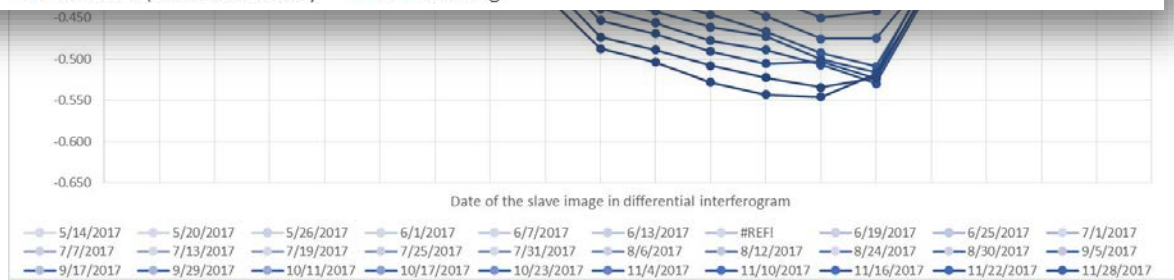

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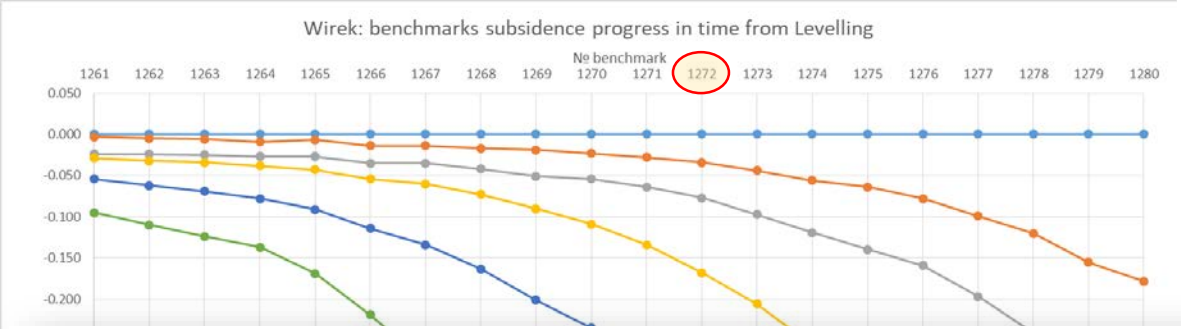

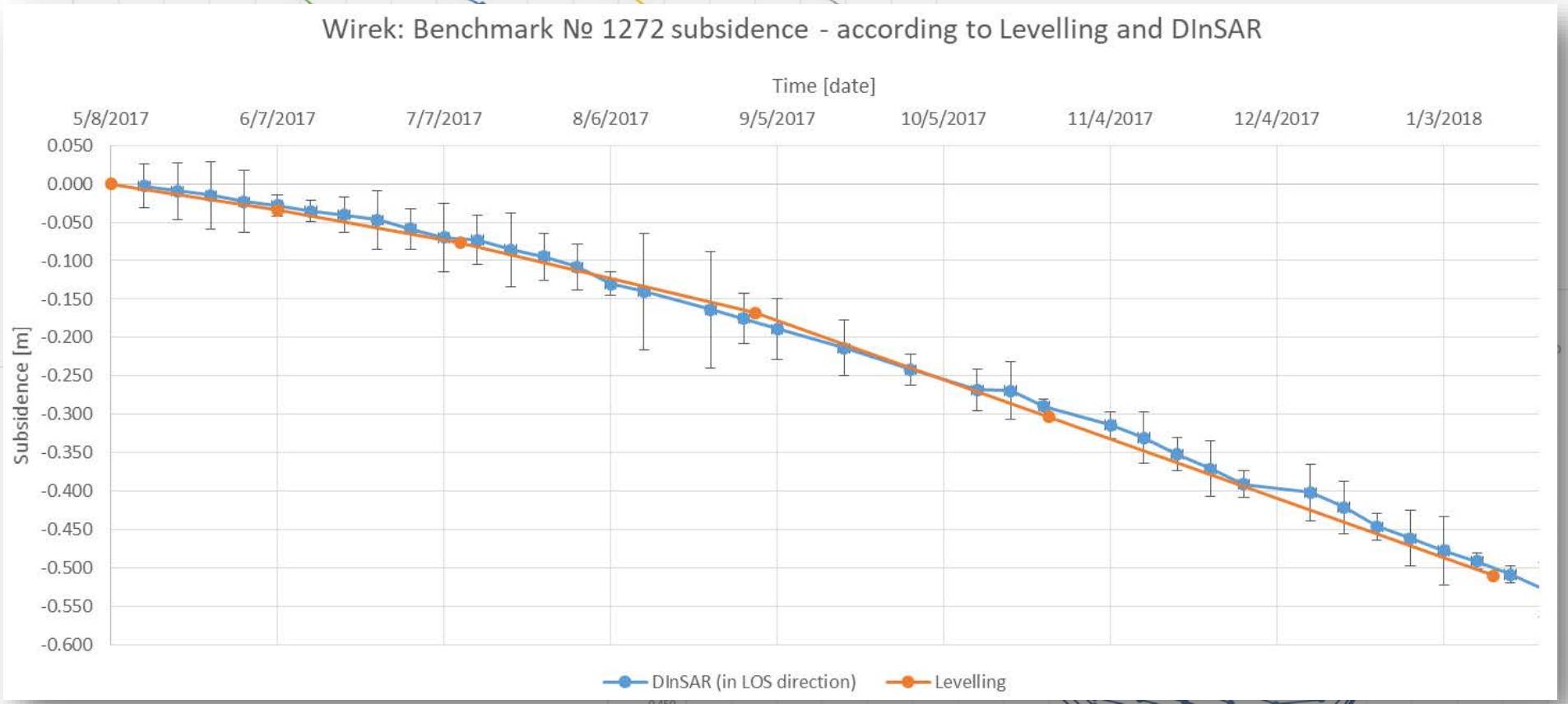

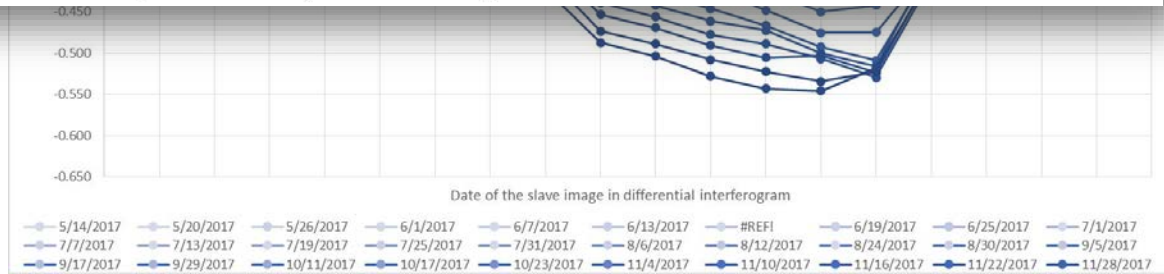

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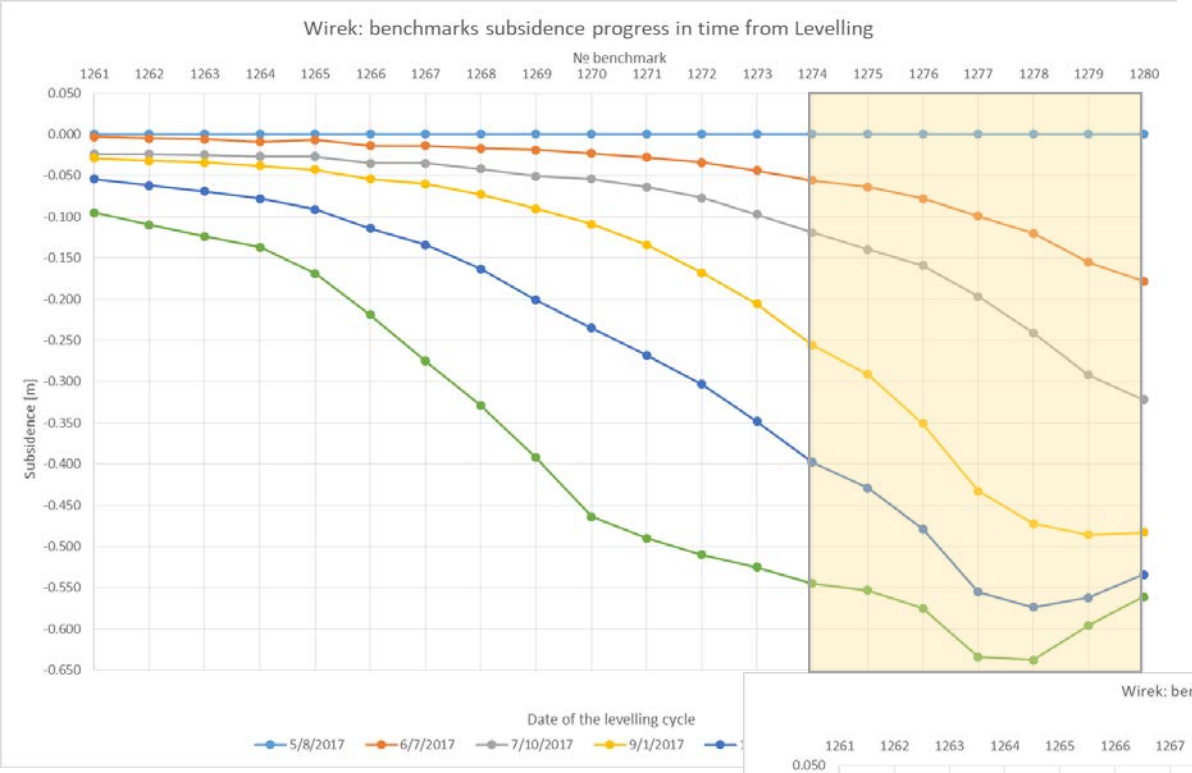
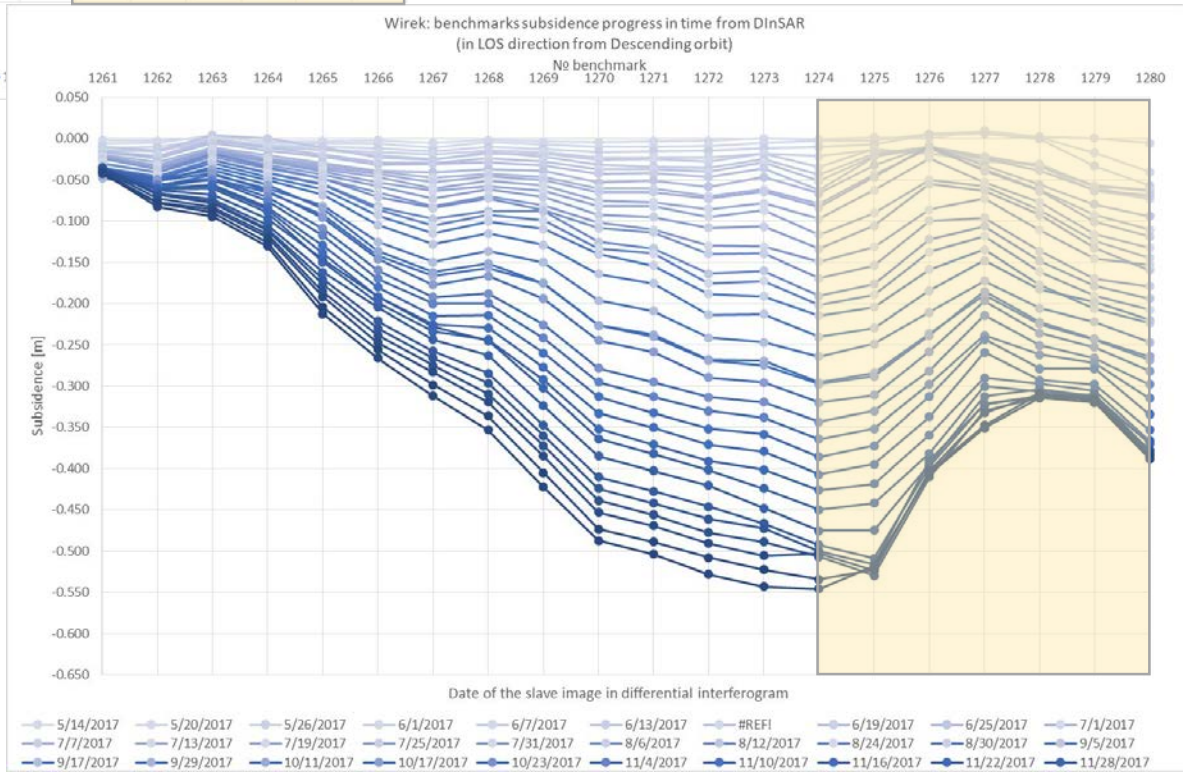


Levelling



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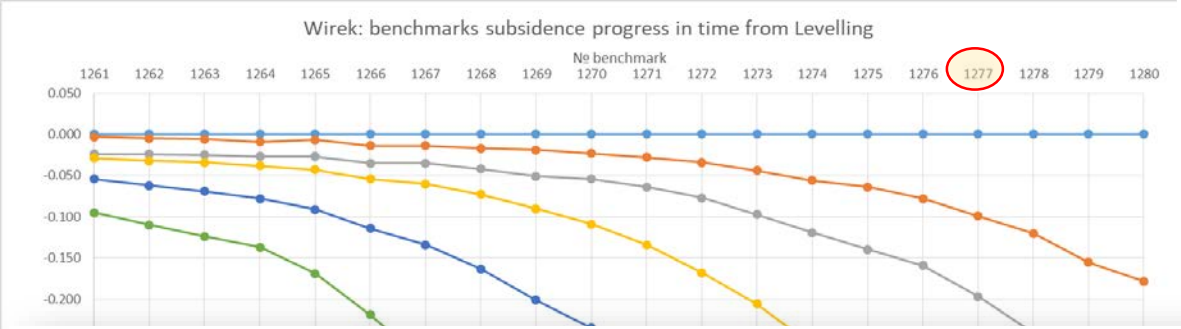

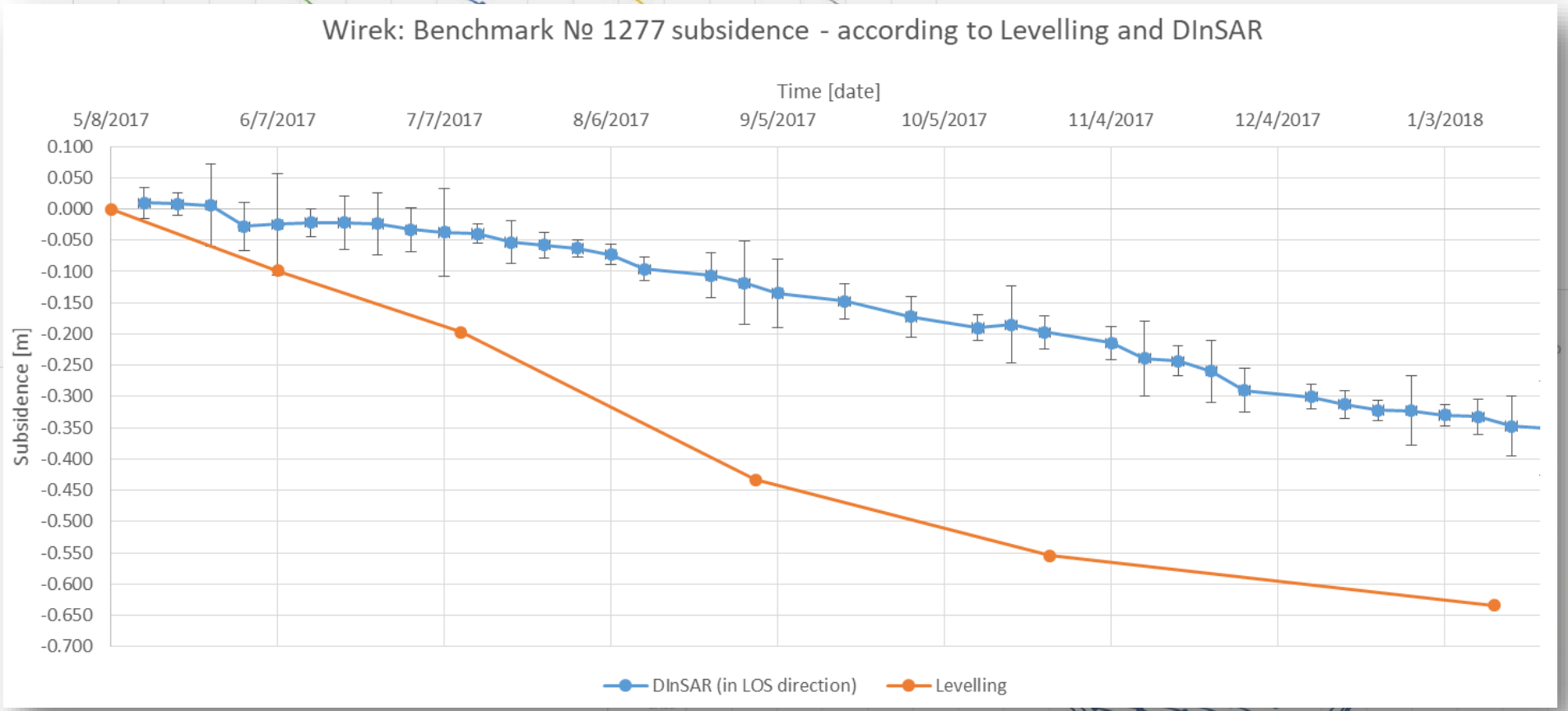

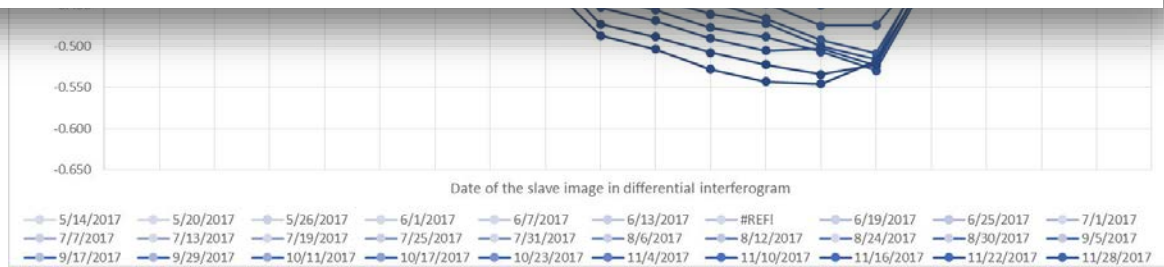

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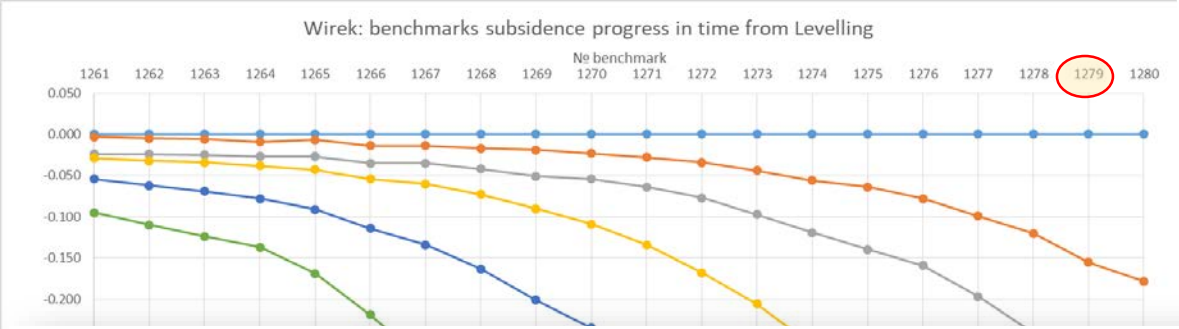

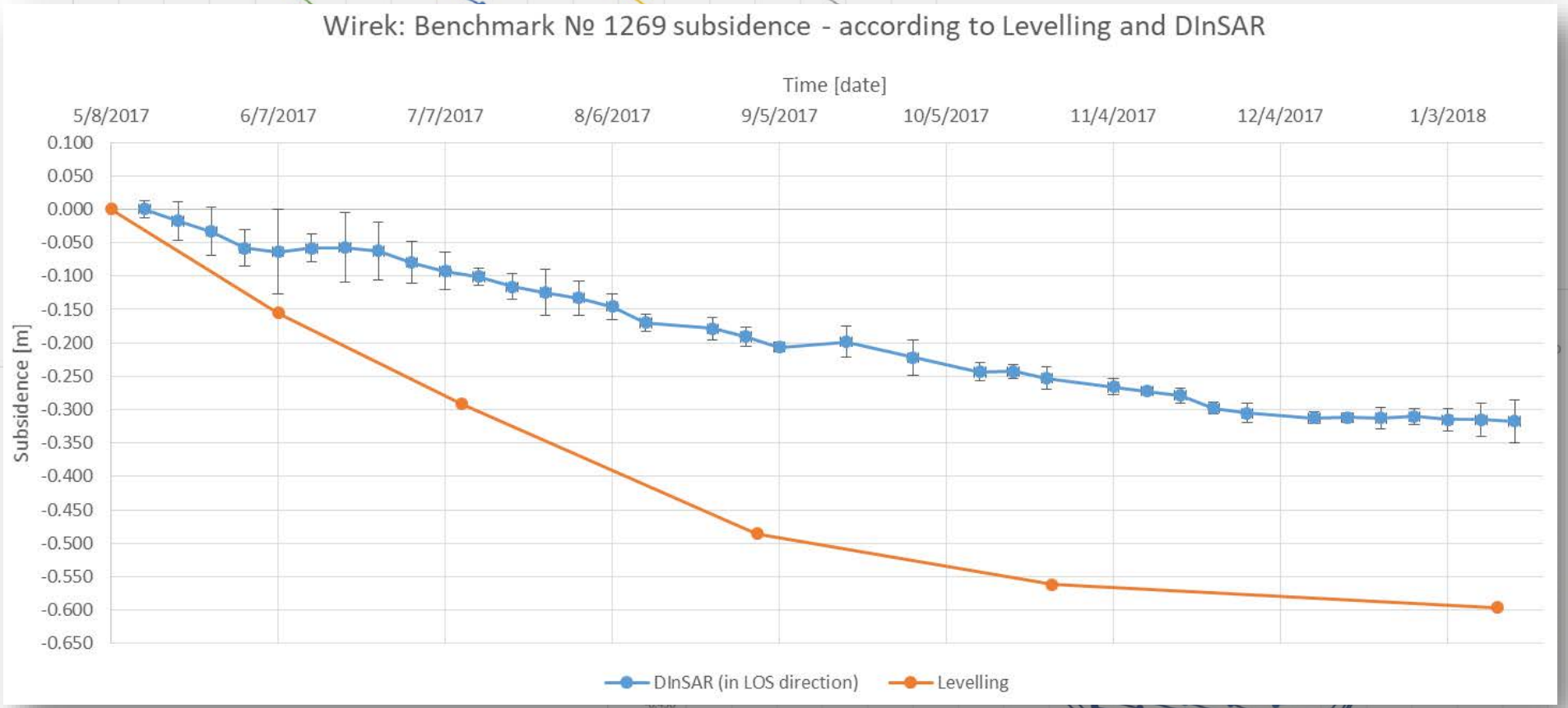

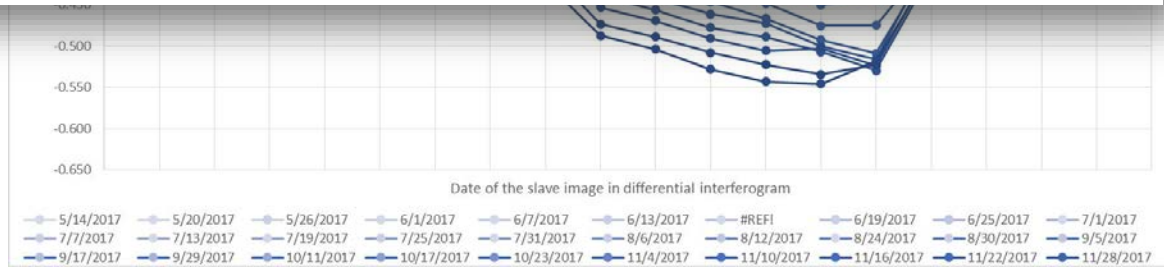

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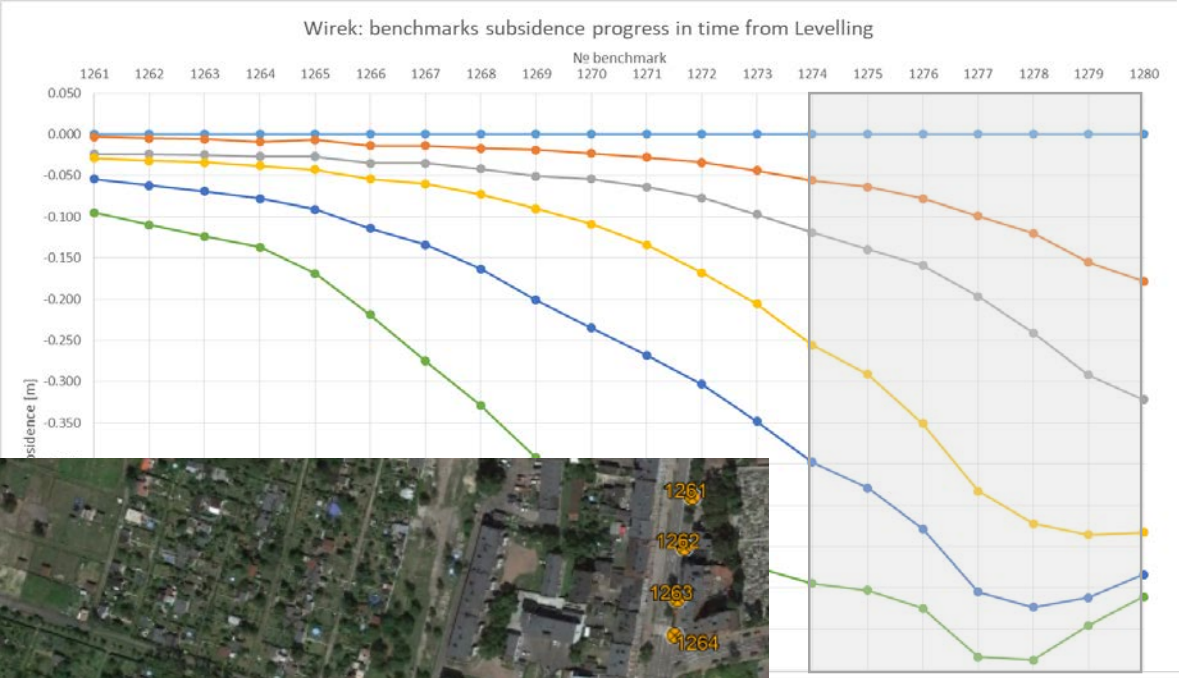
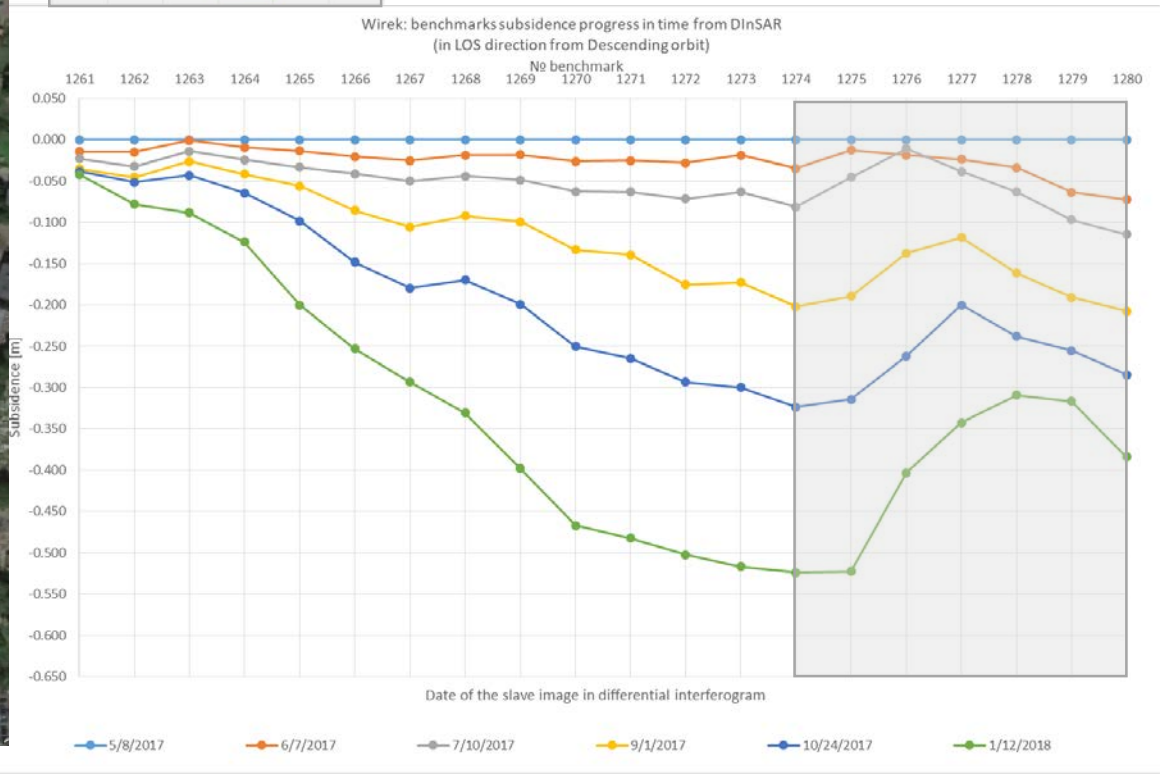
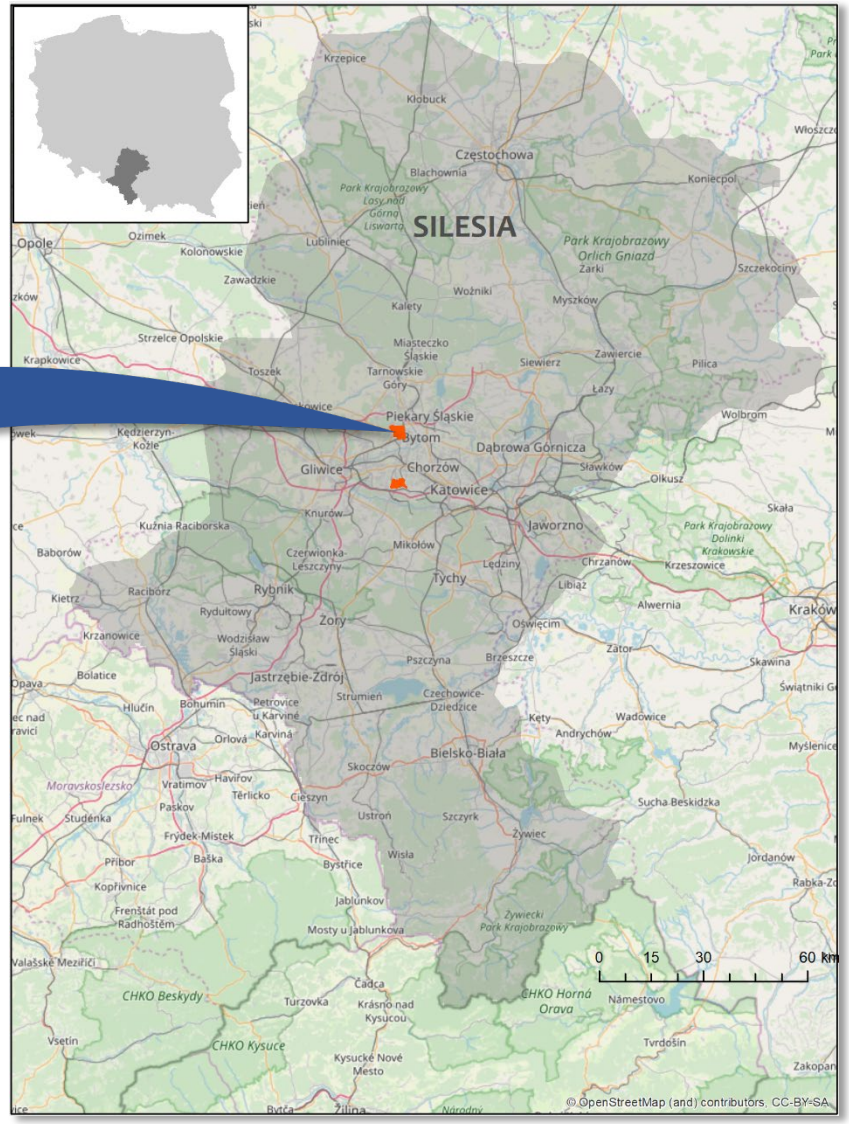

Wirek: benchmarks subsidence progress in time from Levelling
№ benchmark
1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
-0.300
-0.350
Subsidence [m]

Levelling


1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280


Wirek: benchmarks subsidence progress in time from DInSAR
(in LOS direction from Descending orbit)
№ benchmark
1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
-0.300
-0.350
-0.400
-0.450
-0.500
-0.550
-0.600
-0.650
Subsidence [m]
Date of the slave image in differential interferogram
5/8/2017
6/7/2017
7/10/2017
9/1/2017
10/24/2017
1/12/2018

Mine Bobrek (Miechowice district)



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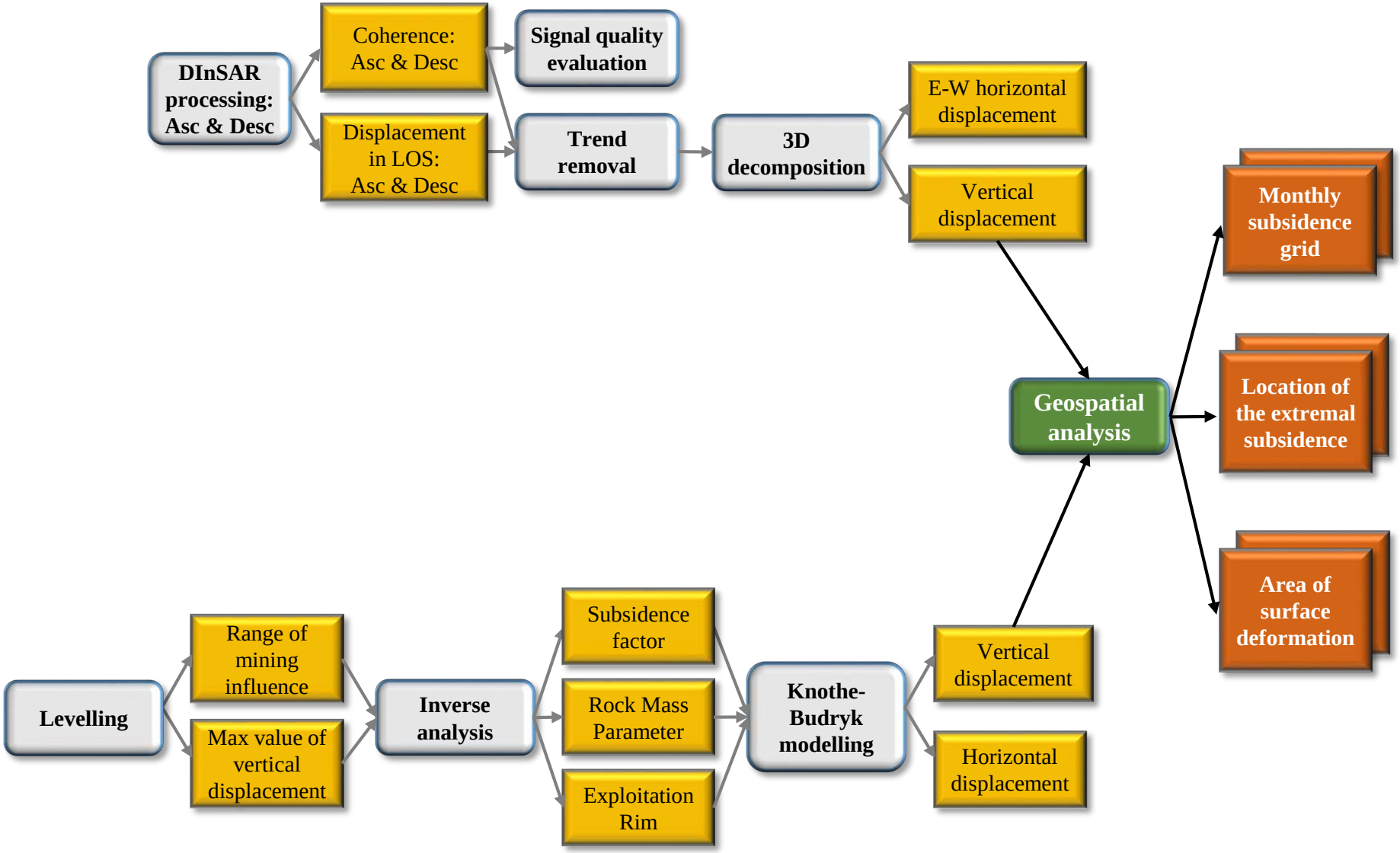
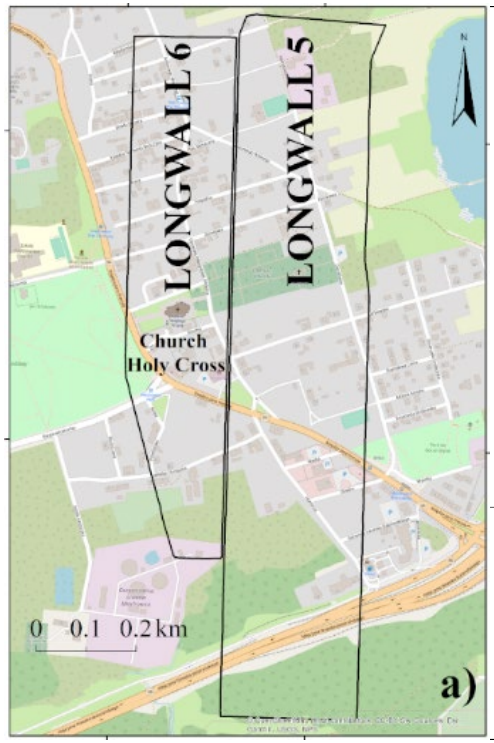
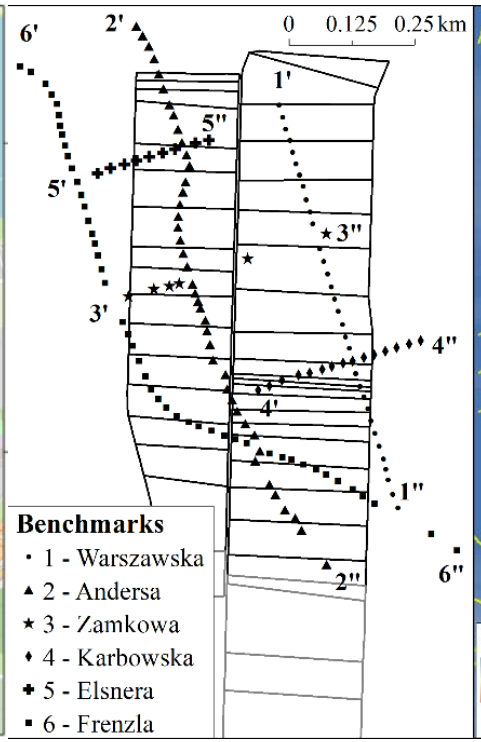
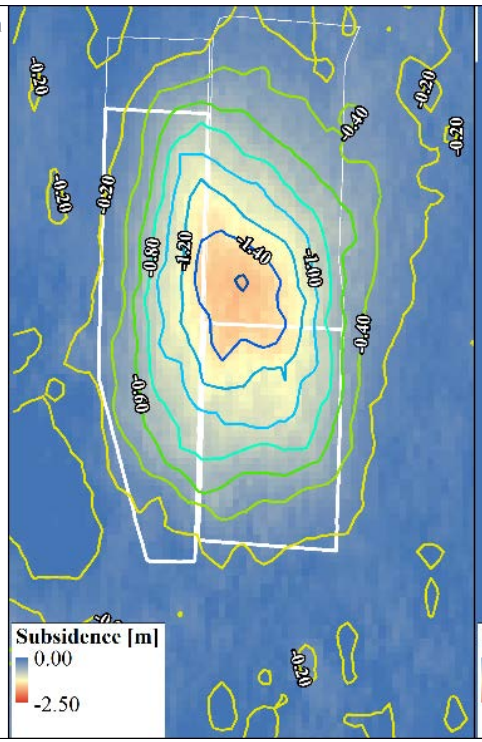
DInSAR post-processing and subsidence prediction modelling

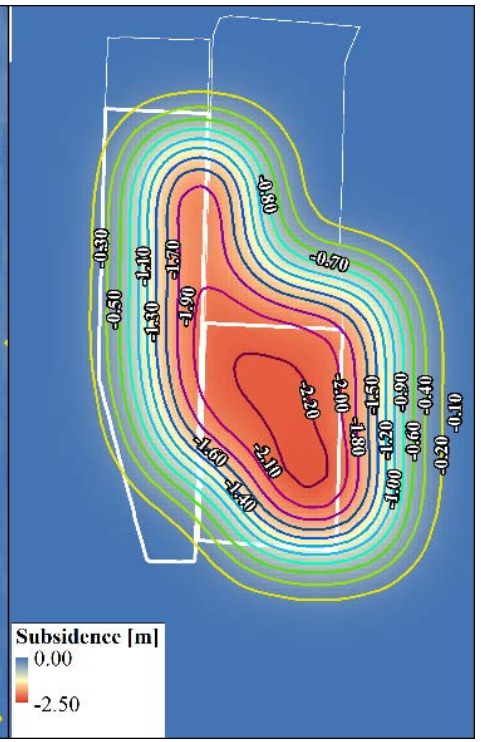


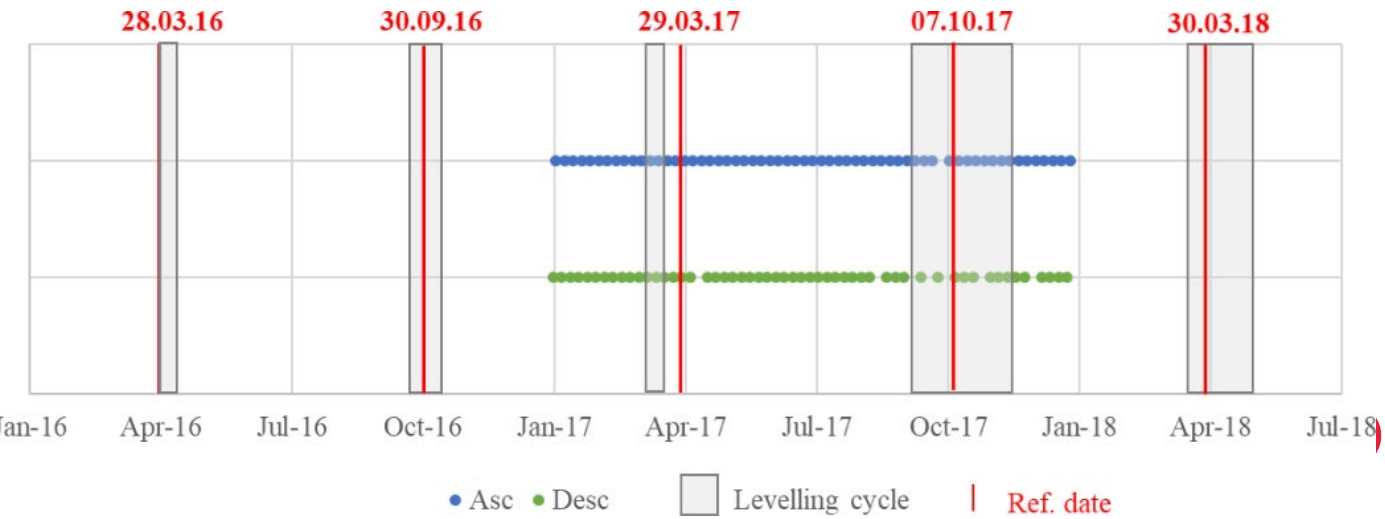
DInSAR, levelling and modelling - 2017











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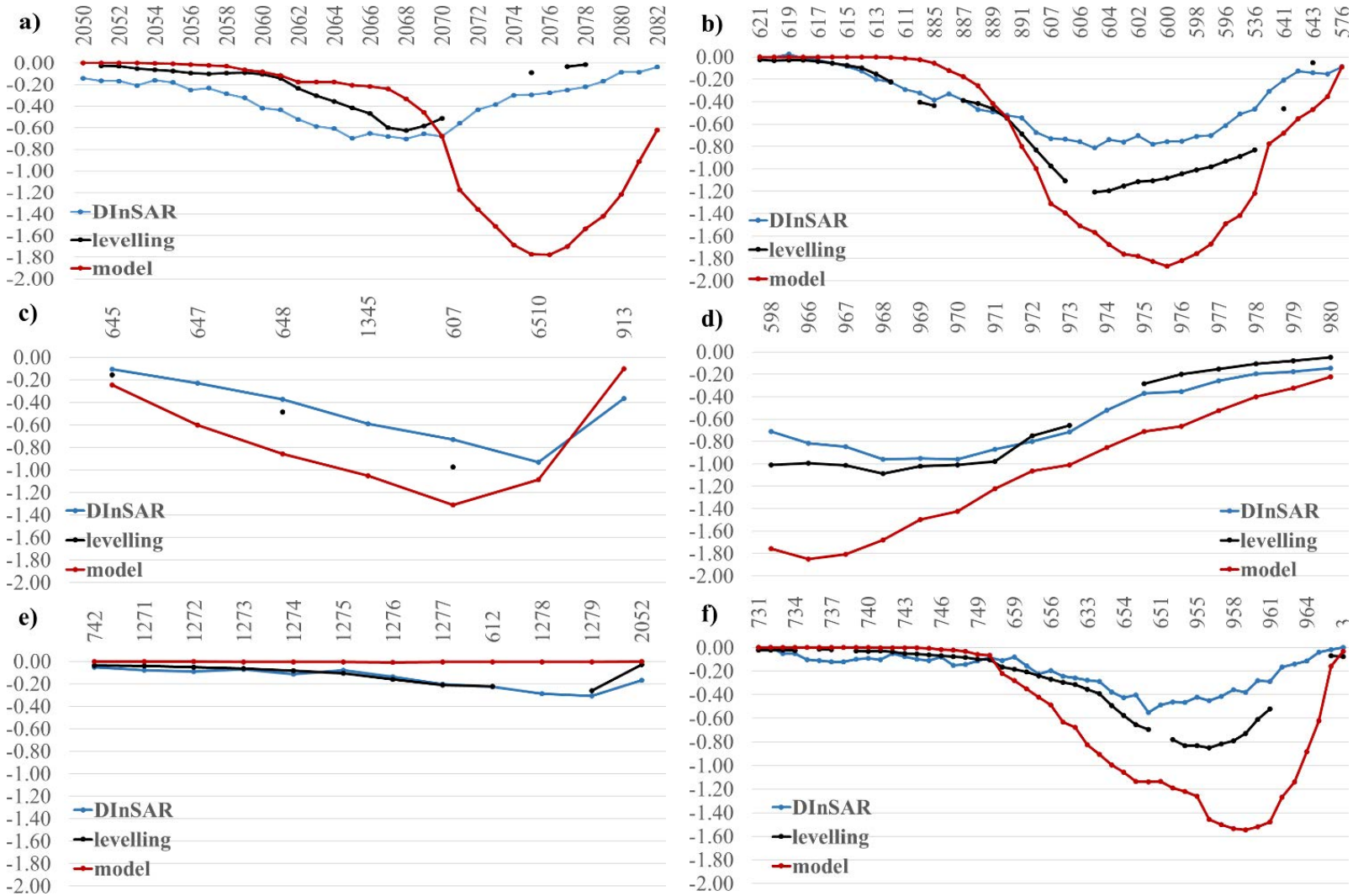
DInSAR, levelling and modelling along levelling lines



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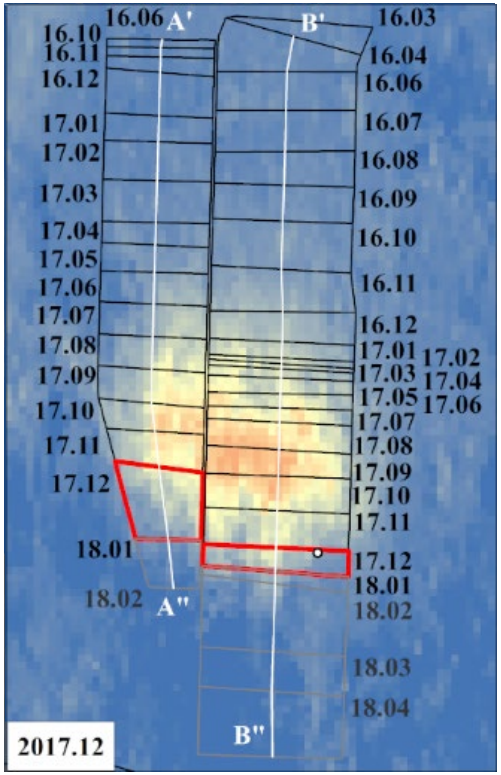

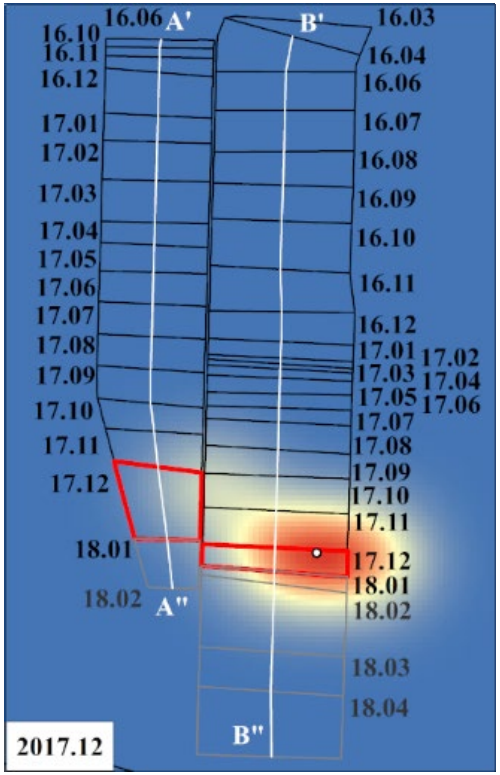

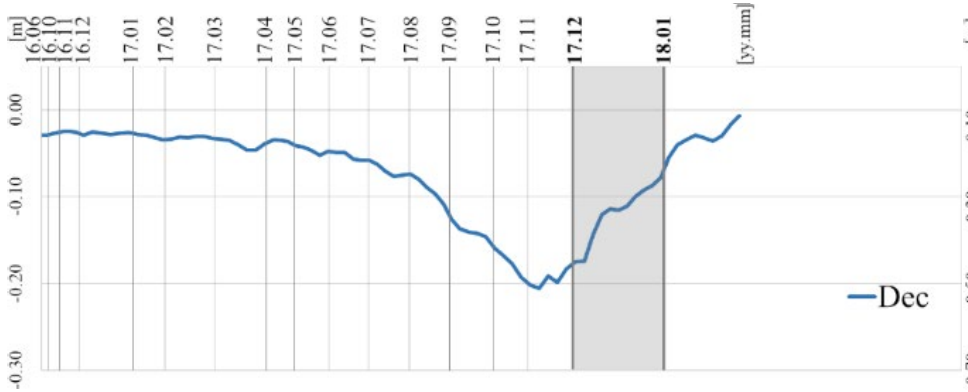

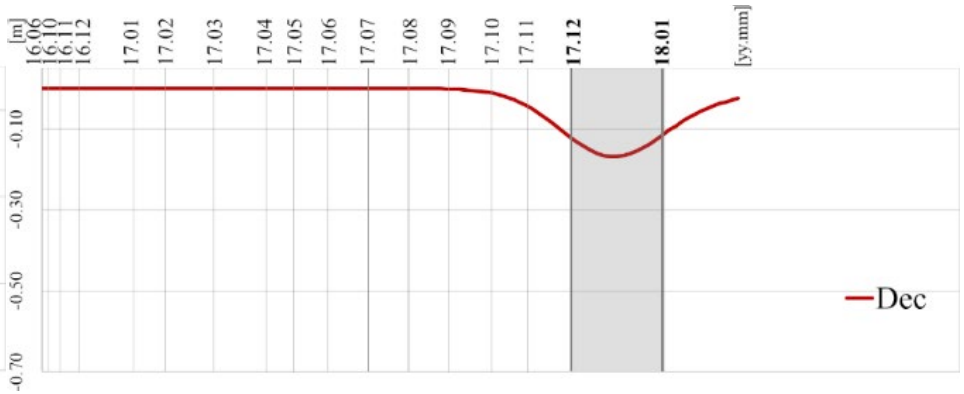

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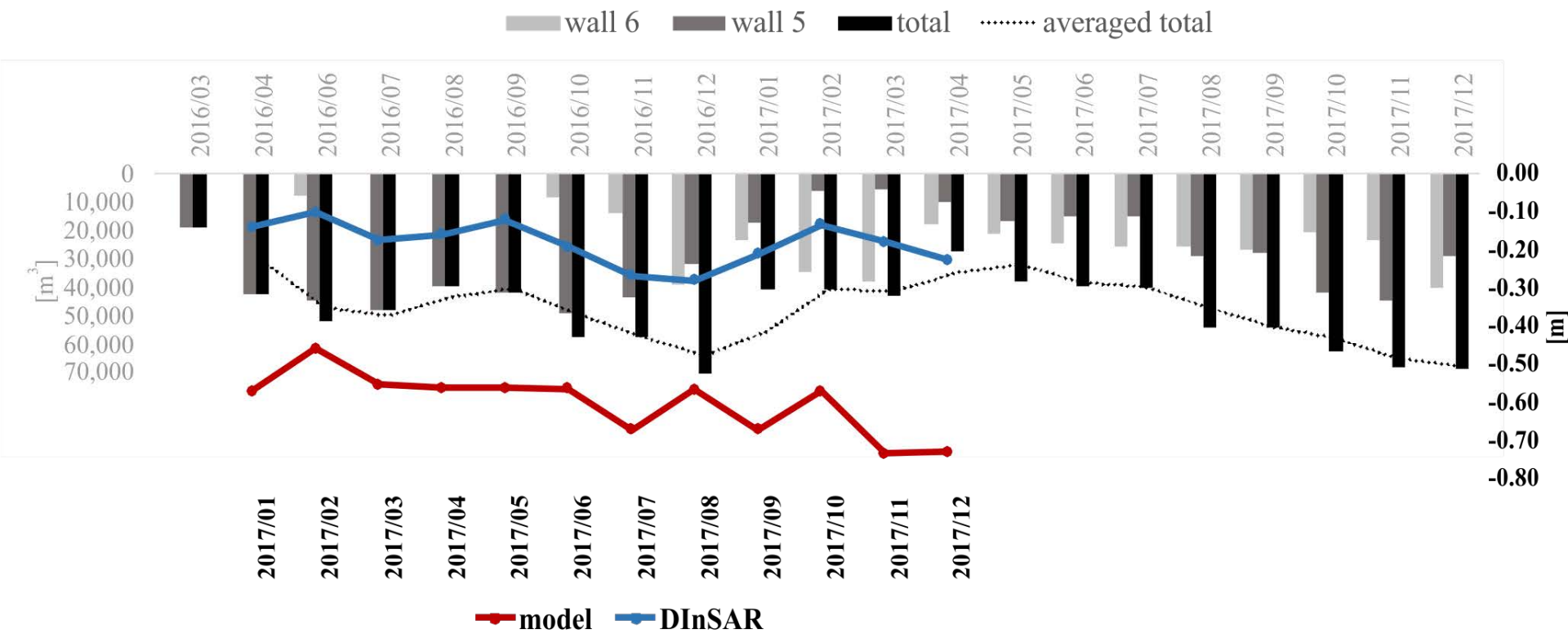
DInSAR, modelling and amount of extracted material



Thank you for the attention!

maya.ilieva@upwr.edu.pl

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