

3D ERT Time-Lapse on a River Bank (Salerno2)

ERT cross-boreholes tomography on a River bank

Report for the background dataset, collected in Salerno.

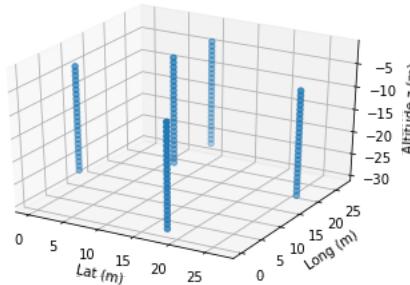
December 6th, 2021

Salerno field site 2

Data acquisition

Important

- number of boreholes: 5
- electrode spacing: 1m
- nb of electrodes/boreholes: 24
- ! Topography, 1st electrode depth different according to borehole position



Data processing

- 1167 duplicates removed
- reciprocal filter 10%

Note

```

Survey.filterDefault: 1167 duplicates removed.
Survey.filterDefault: 2 measurements with A or B == M or N
filterData: 2 / 19221 quadrupoles removed.
18558/19219 reciprocal measurements found.
6512 measurements error > 20 %
18558/19219 reciprocal measurements found.
6512 measurements error > 20 %
9542 measurements with greater than 10.0% reciprocal error removed!

```

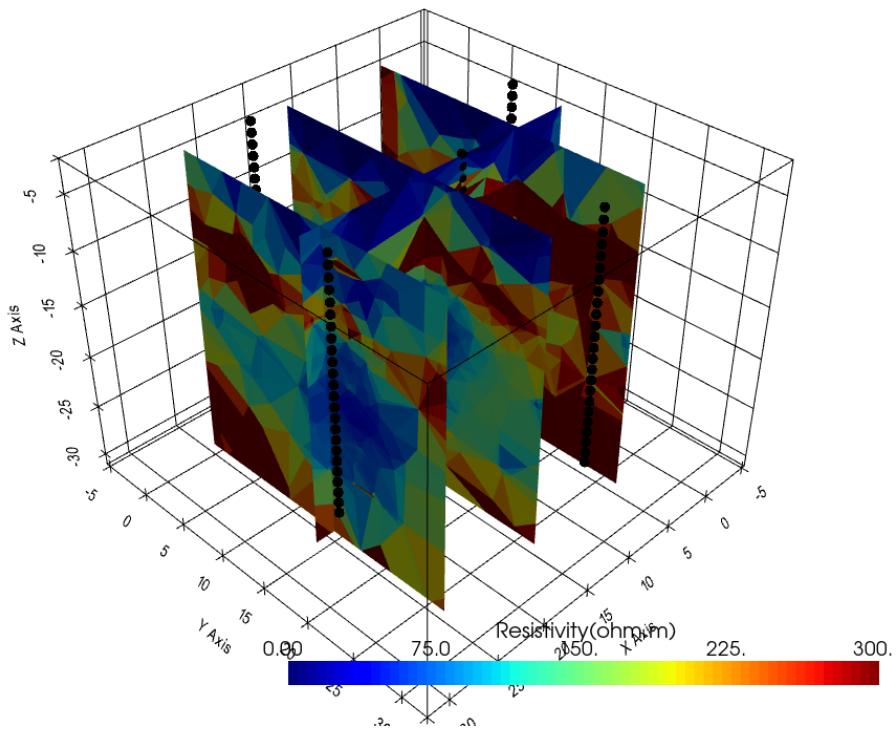
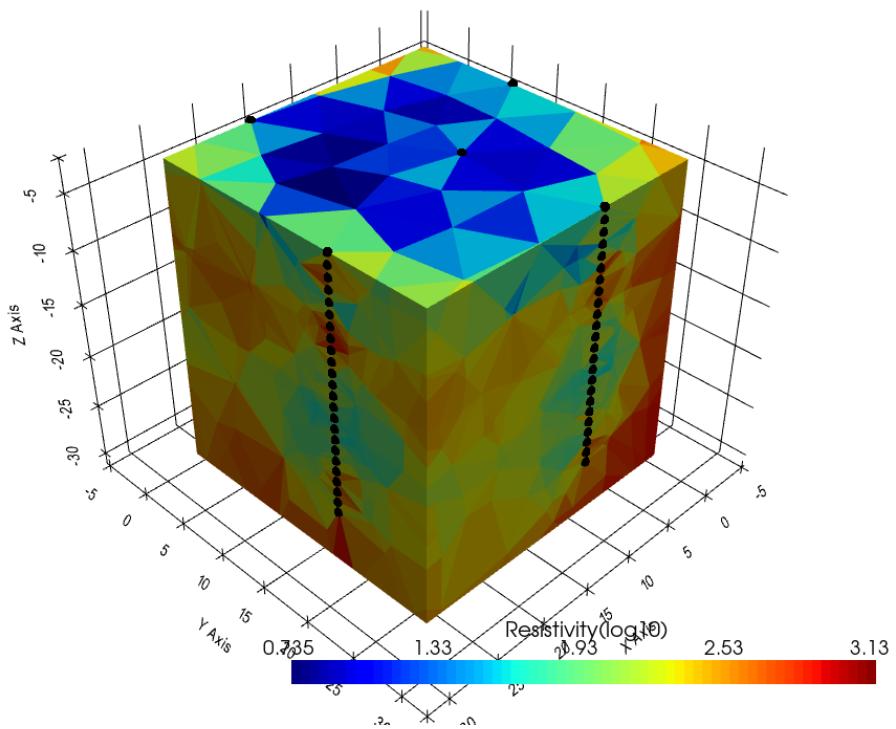
Mesh

Correction of topography

Inversion

Preliminary Results (November 22, 2021) - coarse mesh

For interactive vtk visualization see output folder.



Notebook to reproduce the data: Salanto_2

Individual inversion

April 4, 2022, Time 0(2) to 4(6)

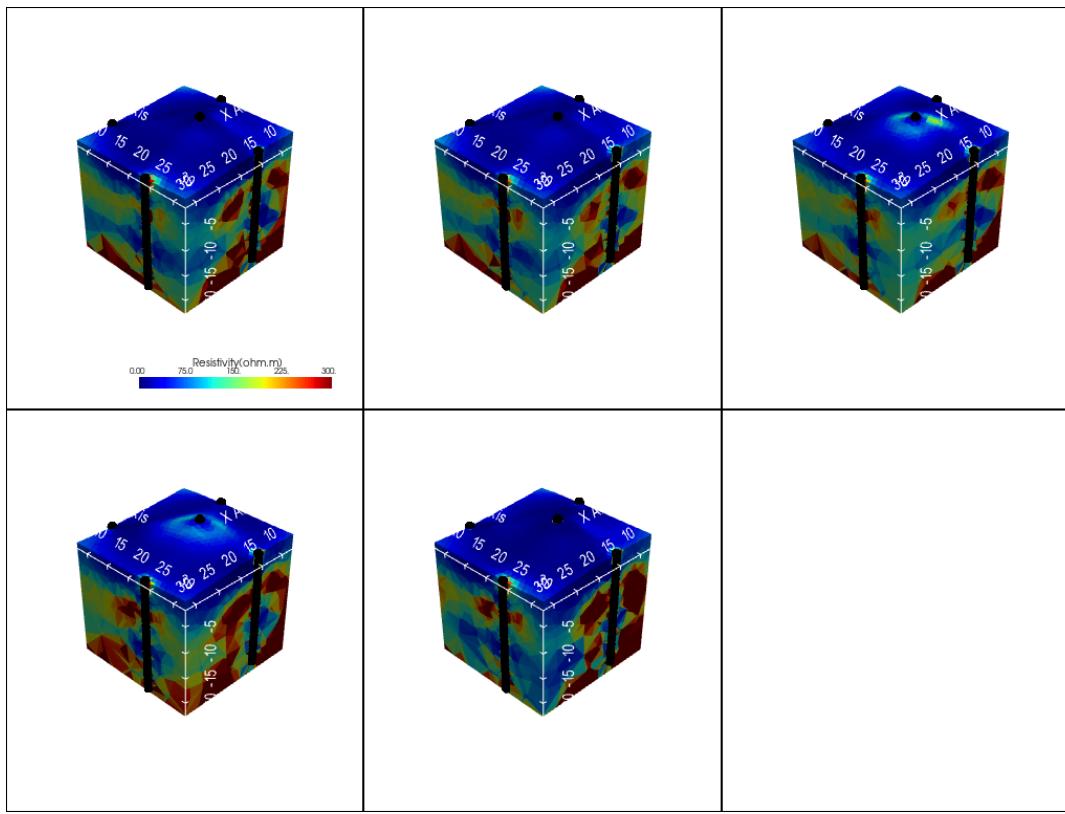


Fig. 1 From left to right and top to bottom: T2 (background, April 4, 2022) to T6, inverted individually with 10% of error (filtered via recoprocals analysis)

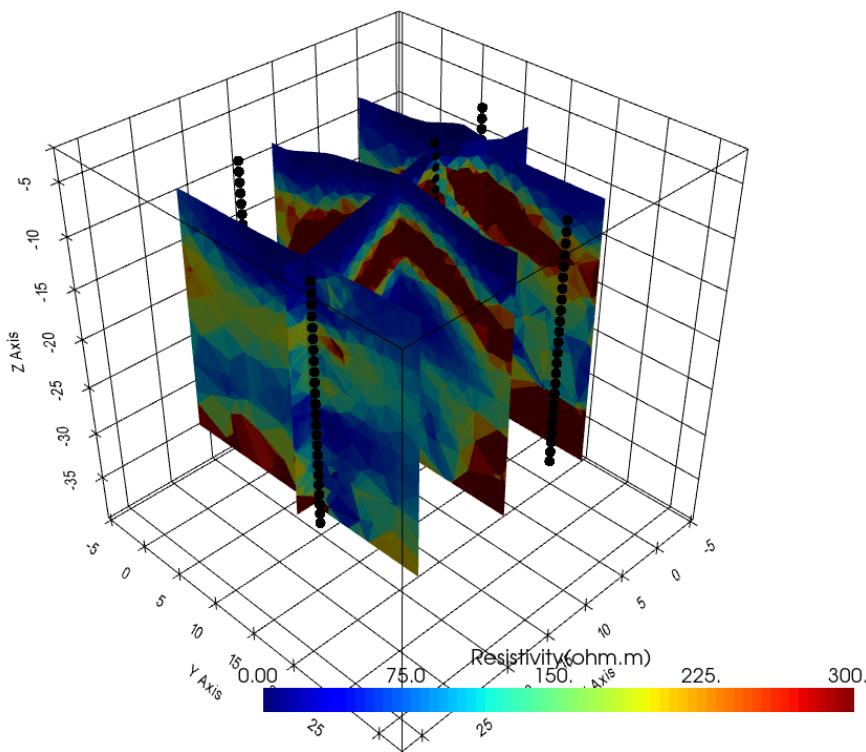


Fig. 2 Top to bottom: T2 (background, April 4, 2022) to T6, inverted individually with 10% of error (filtered via recoprocals analysis)

Time Lapse seasonal

Background inversion

Time lapse inversion between file120data2.dat (April 4, 2022) with file120data1.dat (November 22, 2021) i.e. two natural conditions in different seasons.

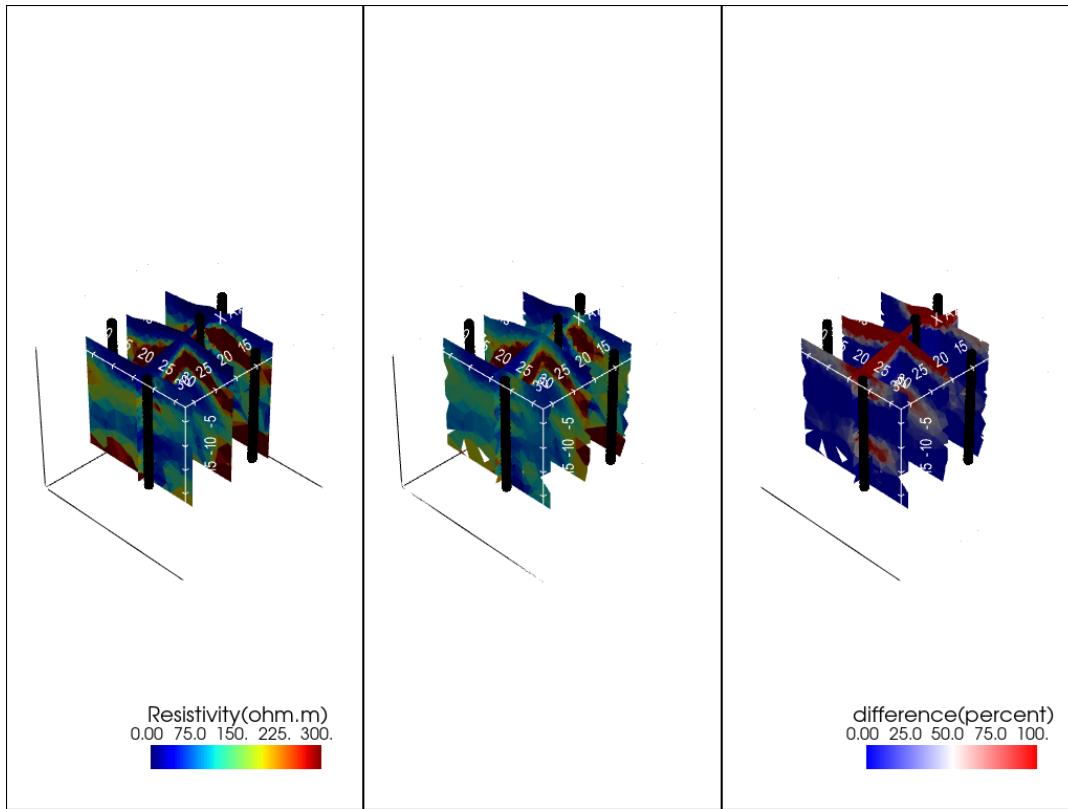


Fig. 3 From left to right: Background Time lapse inversion between file120data2.dat (April 4, 2022) with file120data1.dat (November 22, 2021) i.e. two natural conditions in different seasons and differences (in %).

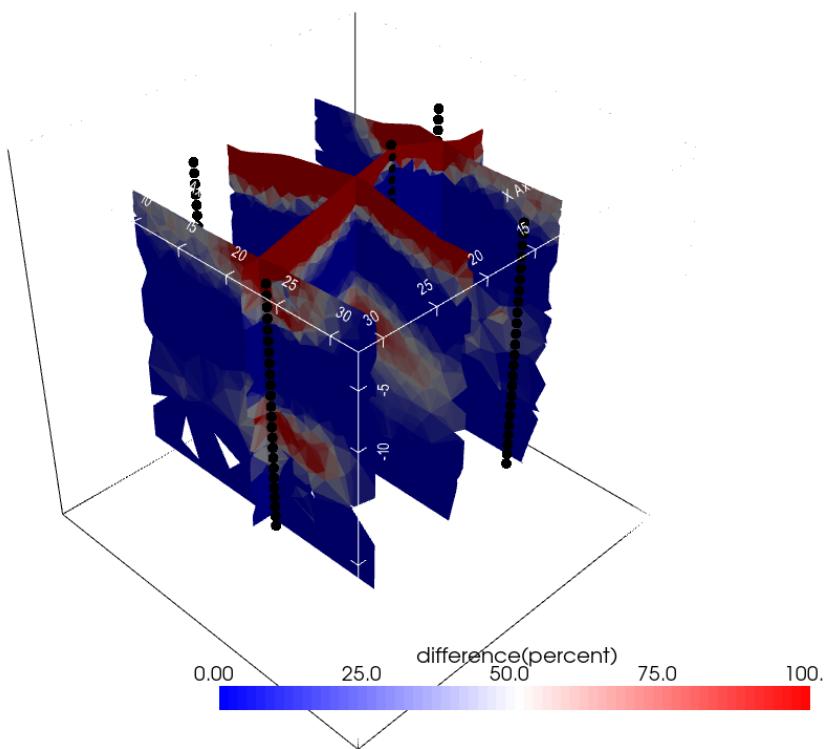


Fig. 4 Time Time lapse inversion differences (in %) between file120data2.dat (April 4, 2022) with file120data1.dat (November 22, 2021) i.e. two natural conditions in different seasons.

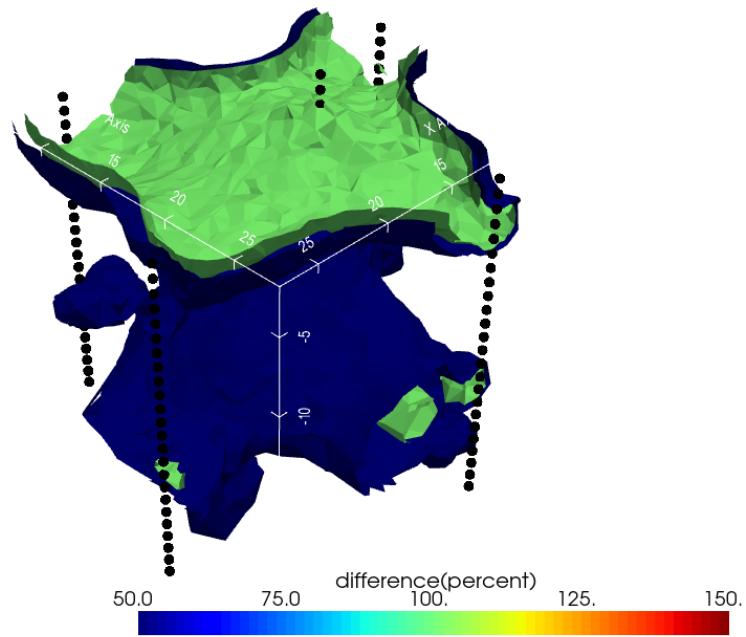


Fig. 5 Isovolumes of differences (%) computed from time lapse inversion between file120data2.dat (April 4, 2022) with file120data1.dat (November 22, 2021) i.e. two natural conditions in different seasons.

Notebook to reproduce

Salorno_2_TL12

Time Lapse tracer inversion

Danger

Here I'm not sure to understand why the differences between background inversion and differences injection for the 1st times (T2/T3) are such different. The max differences for the background is about 450% (!! while 10% for the difference inversion.

Difference inversion

a(T2/T3) | b (T3/T4)

c (T4/T5)| d (T5/T6)

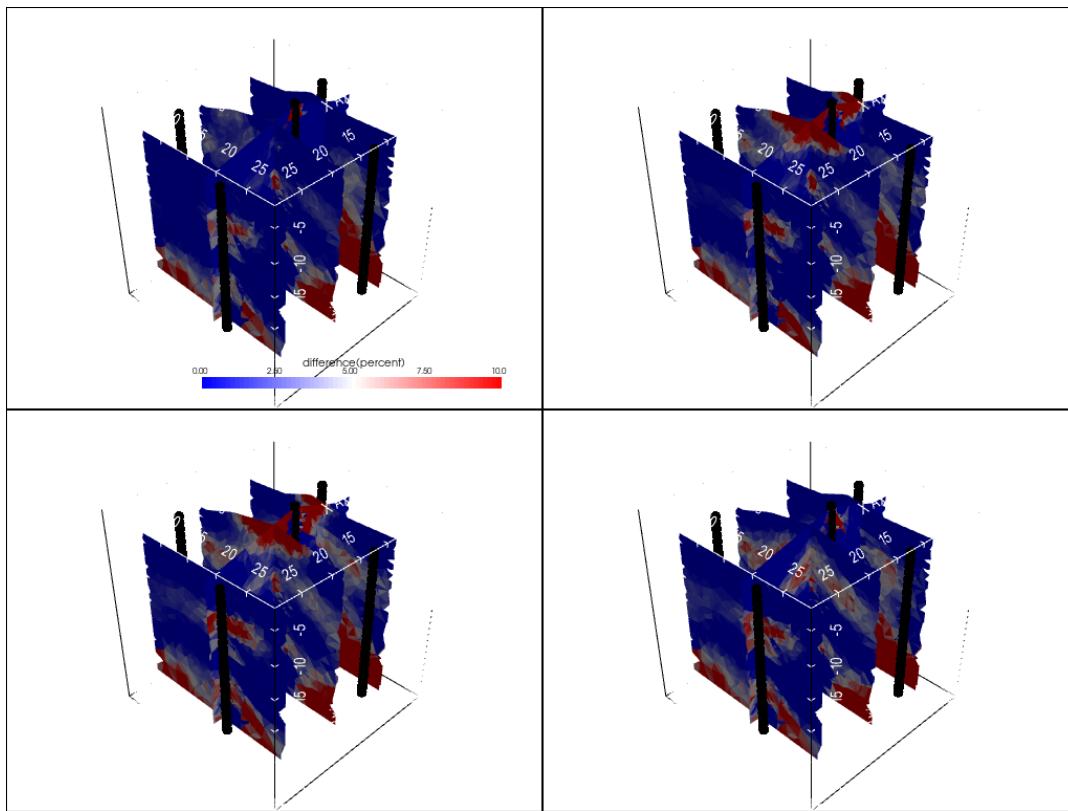


Fig. 6 Time lapse inversion differences (in %) between two consecutive times from T2 (file120data2.dat April 4, 2022) to T6. Differences range from 0 to 10%.

Background inversion

a(T2/T3) | b (T2/T4)

c (T2/T5)| d (T2/T6)

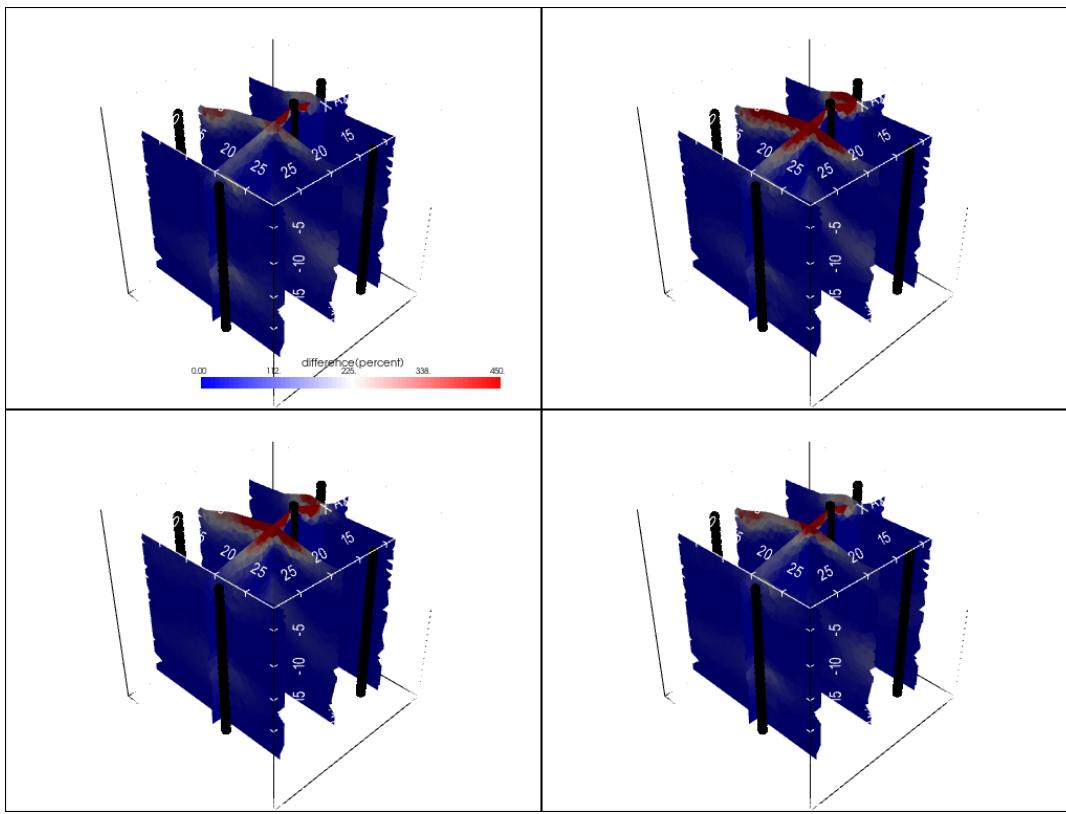


Fig. 7 Time lapse inversion differences (in %) between two consecutive times from T2 (file120data2.dat April 4, 2022) to T6. Differences range from 0 to 10%.

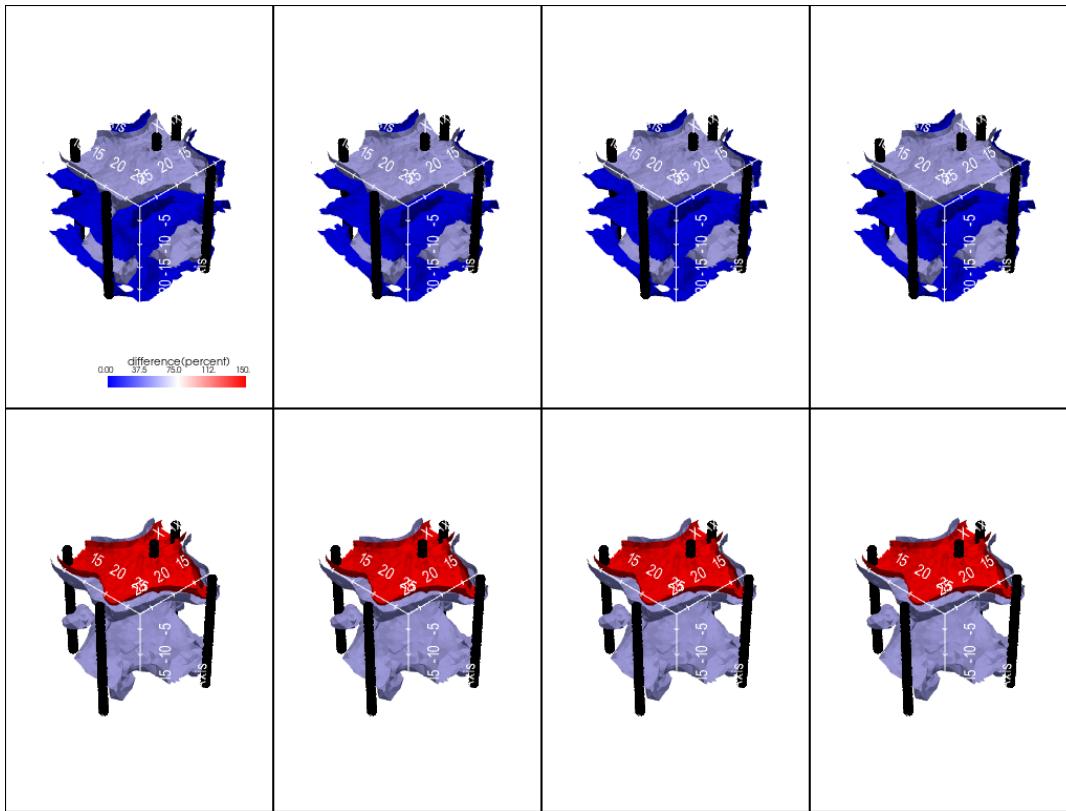


Fig. 8 Isovolumes of differences (%) computed from time lapse inversion between T2 (file120data2.dat April 4, 2022) and T3, T4, T5, T6.

Notebooks to reproduce

Salorno_2_TL2b3456_reg1 Salorno_2_TL2b3456_reg2

Data Repository

Data are available on [github](https://github.com/BenjMy/Salorno_river)

By benjm

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