


INSTITUTO SUPERIOR TÉCNICO




LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL

LAND SUBSIDENCE IN LISBON AREA: VALIDATION OF PSINSAR RESULTS


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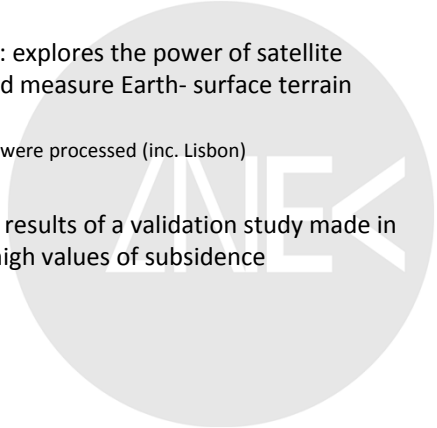
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TERRAFIRMA Project

- > Terrafirma – an ESA GMES project: explores the power of satellite radar interferometry to detect and measure Earth- surface terrain motion.
 - 1st stage: 14 cities from across Europe were processed (inc. Lisbon)
- > In the paper will be presented the results of a validation study made in an area of Lisbon that presented high values of subsidence



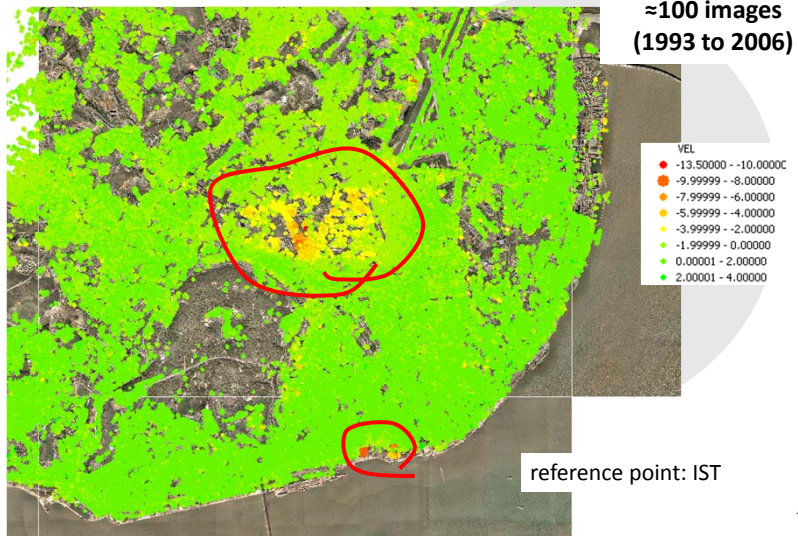



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Lisbon area



PSINSAR - results



Laranjeiras / Luz / Cidade Universitária / Campo Grande

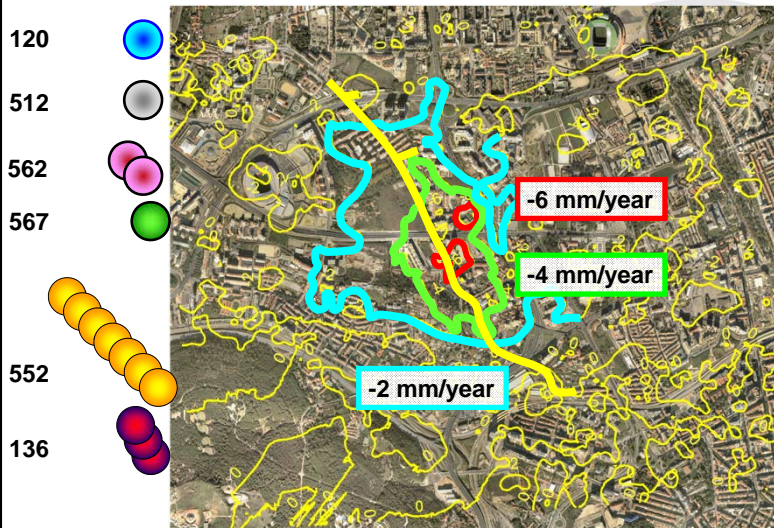


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Benchmarks (Est. Laranjeiras/Luz)

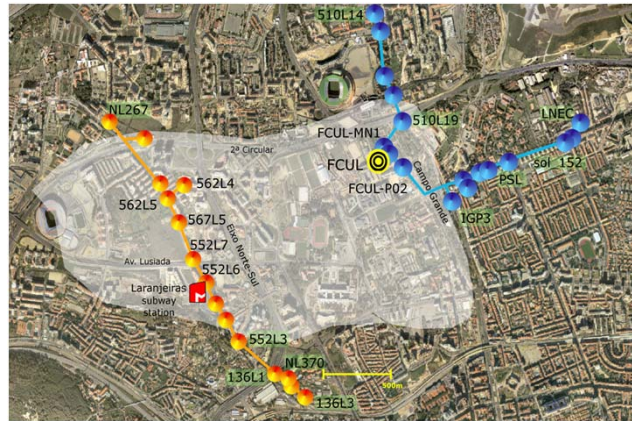


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Levelling lines & GNSS station



FCUL station



IST station



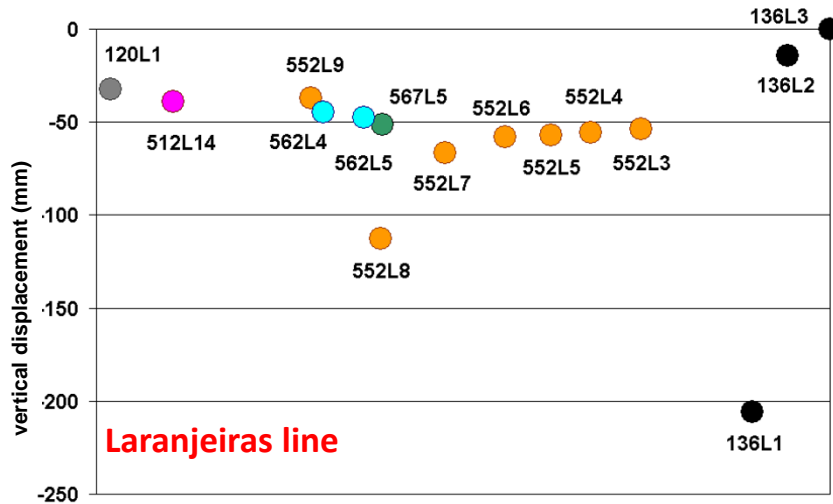
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Levelling (2009)



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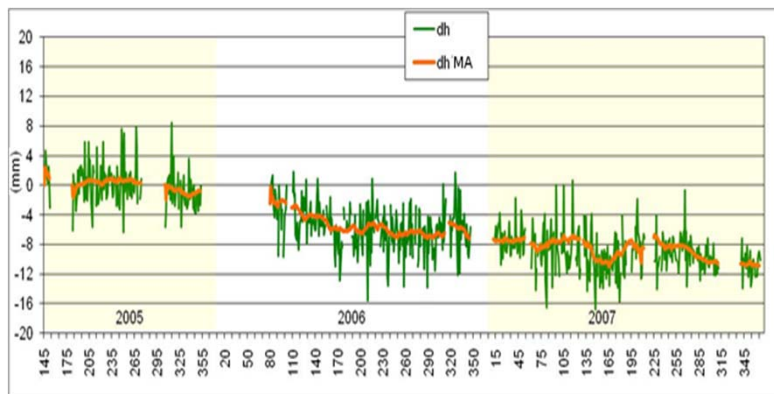
Vertical displacements in 2009 (reference 1995)



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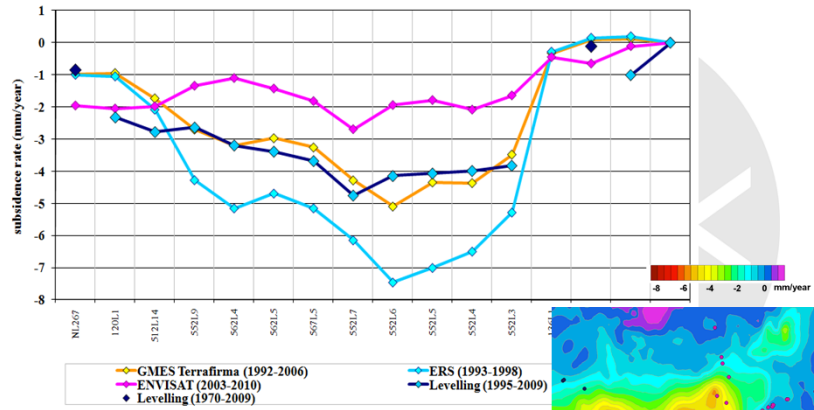
GNSS vertical displacements (2005 to 2007)



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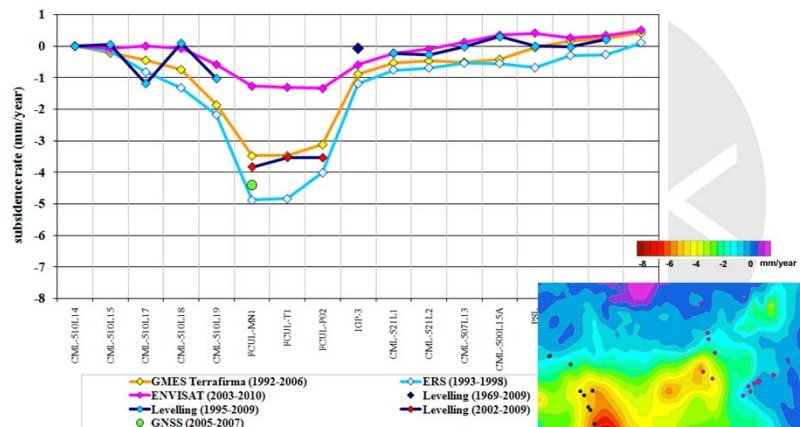
Laranjeiras subsidence rate



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Campo Grande subsidence rate

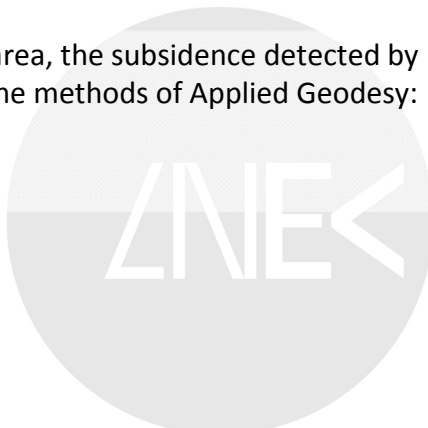


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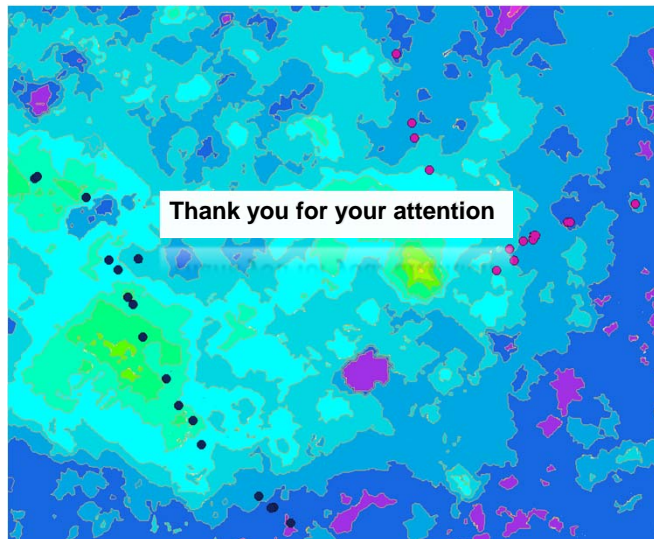


Conclusion

In Laranjeiras / Campo Grande area, the subsidence detected by PSInSAR was confirmed with the methods of Applied Geodesy: GNSS and levelling



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