

6TH GEO EUROPEAN PROJECTS' WORKSHOP



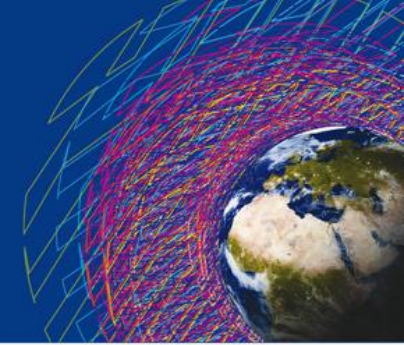
ROME, 7 & 8 MAY 2012



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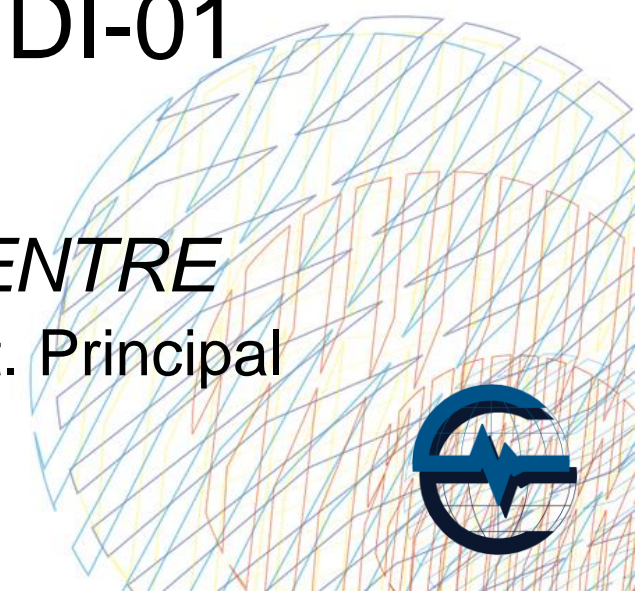


Mapping seismic damage with Very High Resolution COSMO/SkyMed data: an all-Italian contribution to geohazard components of GEO DI-01

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6th GEO Projects workshop
Rome, 7-8 May 2012



GEO DI-01-C2

- DI-01: “Informing Risk Management and Disaster Reduction”
- Implementation supported by the Geohazards Community of Practice and Coastal Zone Community of Practice
- C2: “Geohazards Monitoring, Alert, and Risk Assessment”



C2, Geohazards

- Priority Actions:
 - Integrated approach to geohazards monitoring
 - Supersites and Natural Laboratories
 - Enhance global eqk monitoring, alert, and damage assessment (incl. seismogr. networks)
 - Support global earthquake risk assessment, including the Global Earthquake Model initiative (GEM)
 - Develop large-area vulnerability modelling and mapping



Work in progress

- Integrated approach to ghzs:
 - networking
 - stressing the importance of seismic vulnerability in addition to seismic hazards to estimate seismic risk
- Supersites:
 - linking with GEM – vulnerability data
 - moving to the “Science Cloud”
 - MARSITE project



Work in progress

- global eqk monitoring, alert, and damage assess't:
 - networking researchers in radar-based damage assessment (Pavia, Surrey, Chiba, Tohoku, DLR)
 - FP7 GMES - SAFER Project
 - Italian Civil Protection Dpt – PE Eucentre



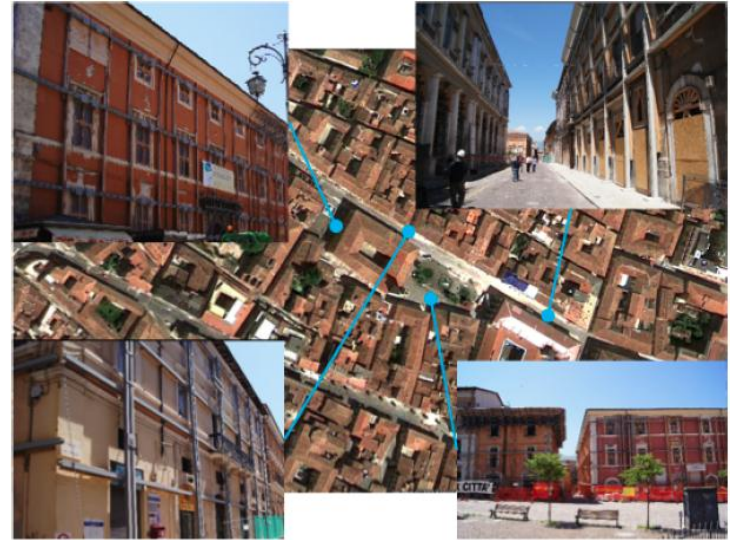
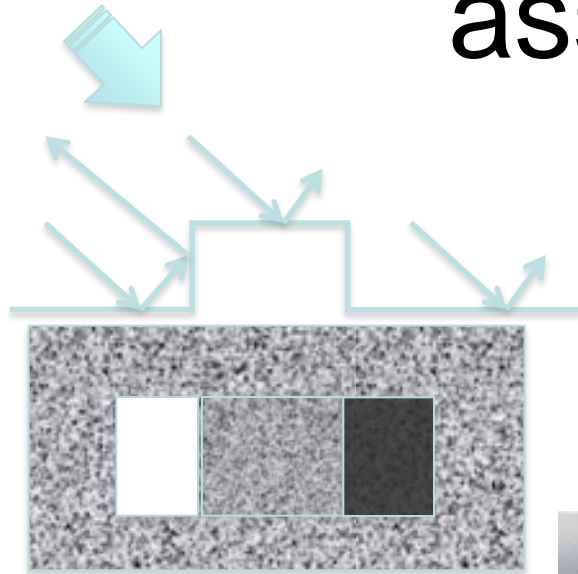
Work in progress

- global earthquake risk assessment:
 - GEM project running smoothly

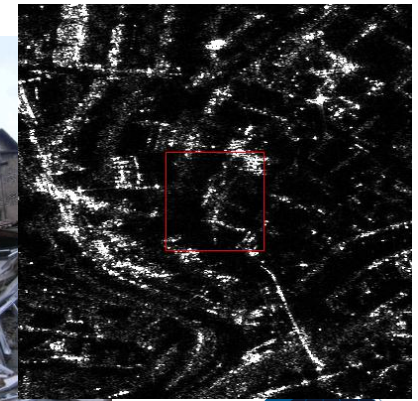
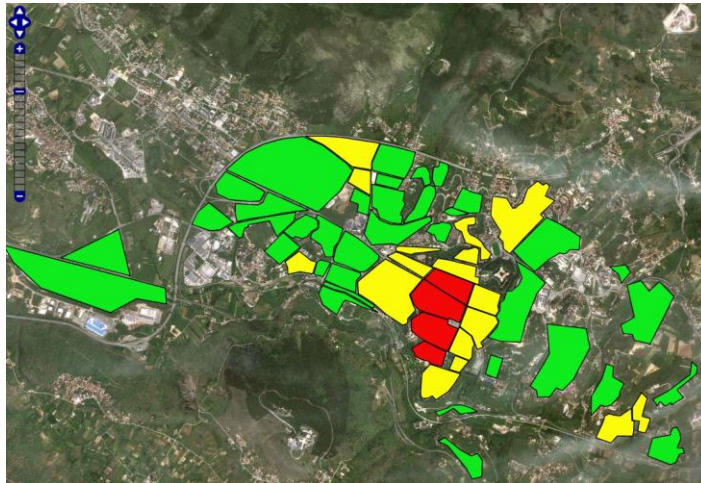
- vulnerability modelling and mapping
 - FP7 SENSUM Project (GFZ Potsdam)



Radar-based damage assessment



L'Aquila,
Italy



cts workshop
May 2012



Publications

- R. Cossu, F. Dell'Acqua, D.A. Polli, G. Rogolino (in press): "SAR-based seismic damage assessment in urban areas: scaling down resolution, scaling up computational performance". Accepted for publication on the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. Dell'Acqua, F.; Bignami, C.; Chini, M.; Lisini, G.; Polli, D. A.; Stramondo, S.; , "Earthquake Damages Rapid Mapping by Satellite Remote Sensing Data: L'Aquila April 6th, 2009 Event," *Selected Topics in Applied Earth Observations and Remote Sensing, IEEE Journal of* , vol. PP, no.99, pp.1, 0 doi: 10.1109/JSTARS.2011.2162721
- Fabio Dell'Acqua, Diego Aldo Polli, (2011) Post-event only VHR radar satellite data for automated damage assessment: a study on COSMO/SkyMed and the 2010 Haiti earthquake . *PHOTOGRAMMETRIC ENGINEERING AND REMOTE SENSING* (ISSN:0099-1112) pp.1037- 1043. Vol.77.
- Dell'Acqua, F.; Gamba, P.; Polli, D.; , "Mapping earthquake damage in VHR radar images of human settlements: Preliminary results on the 6th April 2009, Italy case," *Geoscience and Remote Sensing Symposium (IGARSS), 2010 IEEE International* , vol., no., pp.1347-1350, 25-30 July 2010 doi: 10.1109/IGARSS.2010.5653973

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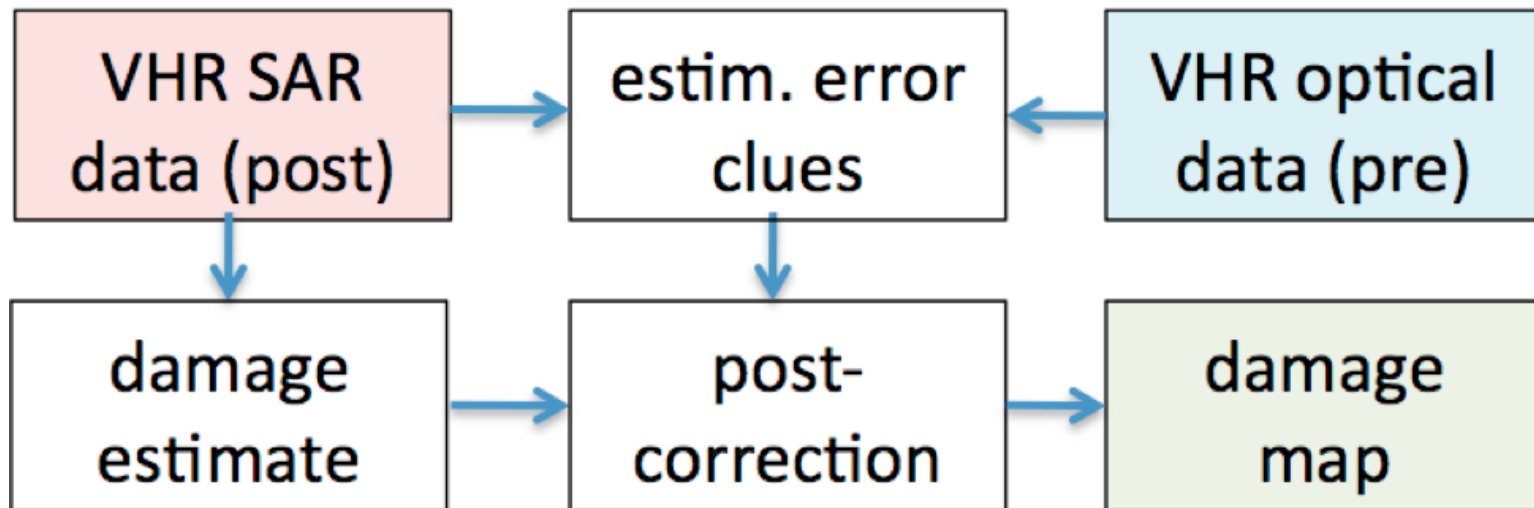
Radar-based damage assessment

- texture-to-damage relationship confirmed across different case studies:
 - Sichuan 2008
 - L'Aquila 2009
 - Port-au-Prince 2010
- accuracy still to be improved → fusion
 - with other methods
 - optical and vulnerability data



Data fusion

- Considering post-correction based on optical data or ancillary information



Conclusions

- DI-01-C2 has a great impact potential on the use of EO for risk management
- More coordination among implementing entities needed
 - telecon, meetings at conferences?
- GMES-next step: connection with GIO?



Conclusions

- Scientific contribution
 - Proving the usefulness of radar data beyond ground motion observation
 - Seismic damage assessment does not necessarily mean change detection
 - Highlighting the importance of vulnerability in computing seismic risk

