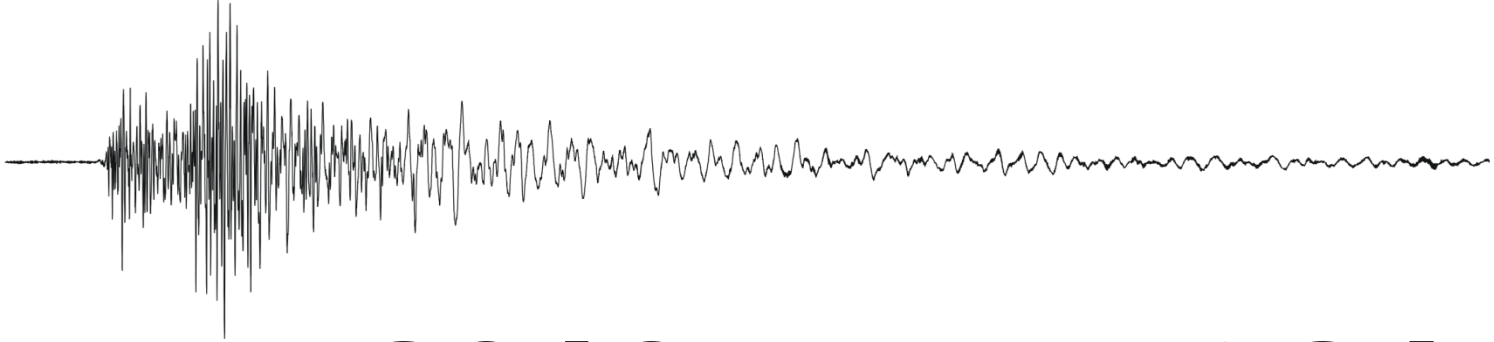

The 2016, August 24, Central Italy Earthquake

Origin Time 01:36:32 UTC, $M_{L(ISNet)}$=6.0; $M_{W(ISNet)}$=6.3

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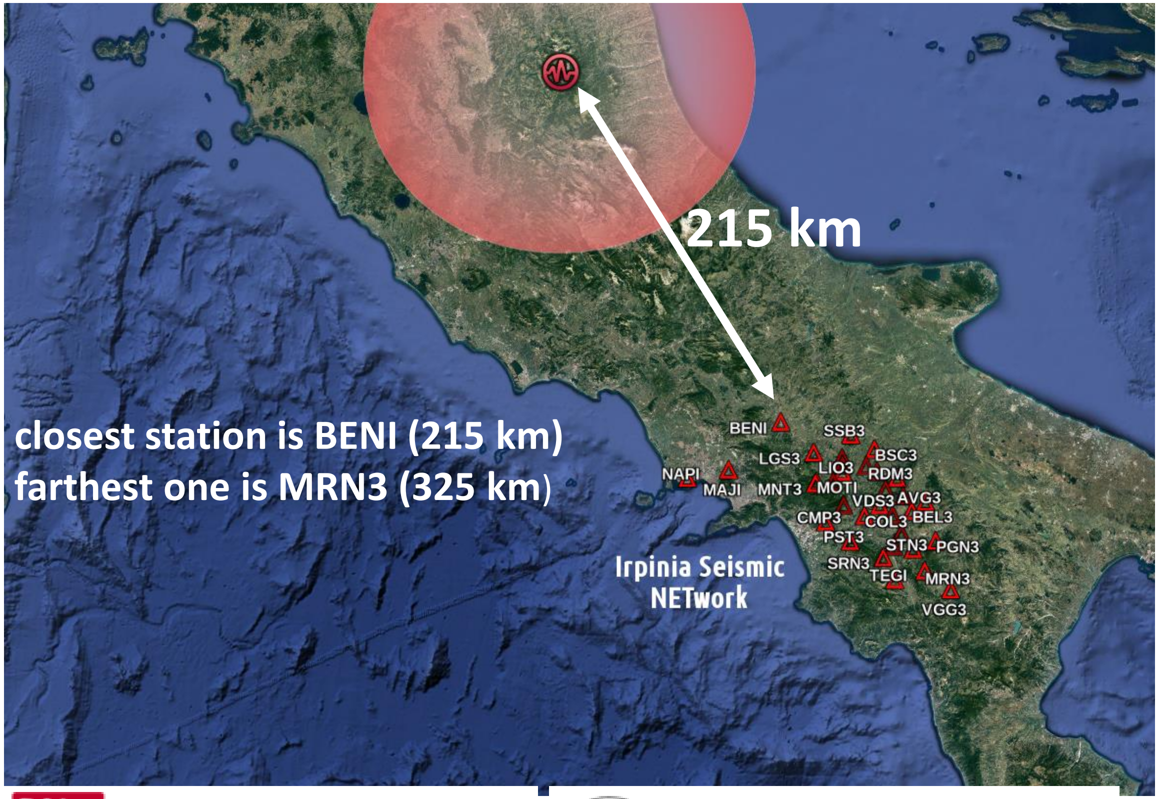
The event as seen from ISNet

We present the results related to the Central Italy earthquake, as seen from ISNet (Irpinia Seismic Network). They concern the magnitude, source parameters, focal mechanism and ground shaking estimations. They are automatically obtained and then revised by RISSC-Lab team.



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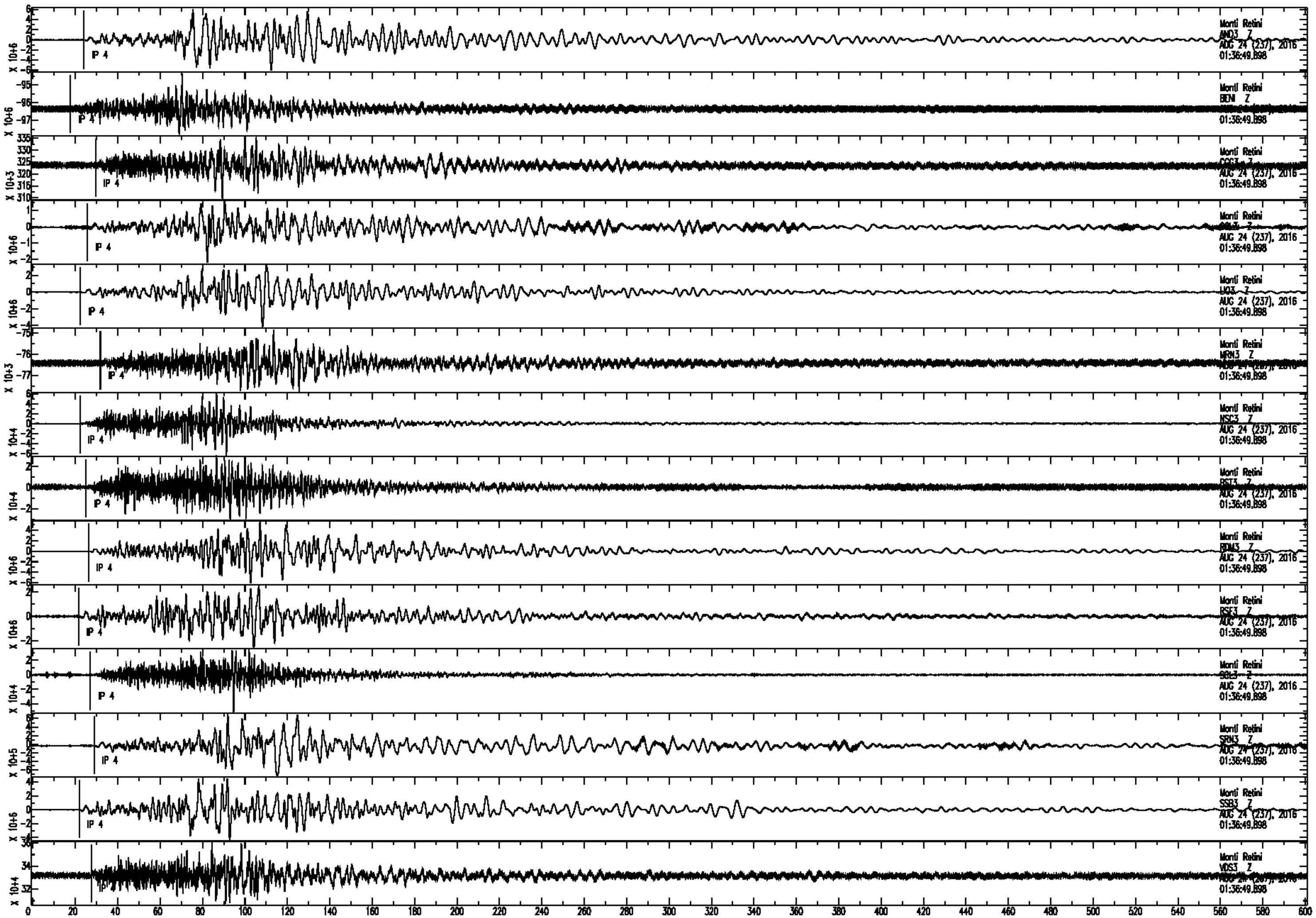
Waveforms



Vertical component of accelerometers from ISNet

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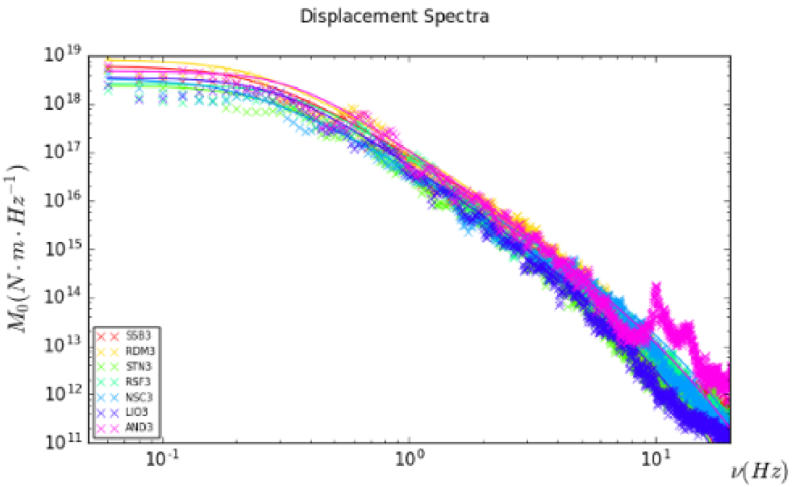
Magnitude and source parameters

ML	Mw	Md	M_0 (Nm)	fc (Hz)	Radius (km)	Δσ (MPa)
6.0	6.3	5.9	4.5×10^{18}	0.27	5.0	11

* Procedures for source parameters computation are described at the end of the presentation



M_w = 6.30 ± 0.13 *Moment magnitude*
ν_c = 0.27 ± 0.05 *Corner frequency*

Observed and inverted displacement spectra at a subset of stations.

The corner frequency retrieved from spectral inversion indicates a rupture size smaller (~10 km) than expected for a M=6.3 event and observed from aftershock distribution.

This can be due to a directivity effect and/or to the occurrence of largest slip in a smaller size asperity. In the former case, the stress drop can be overestimated

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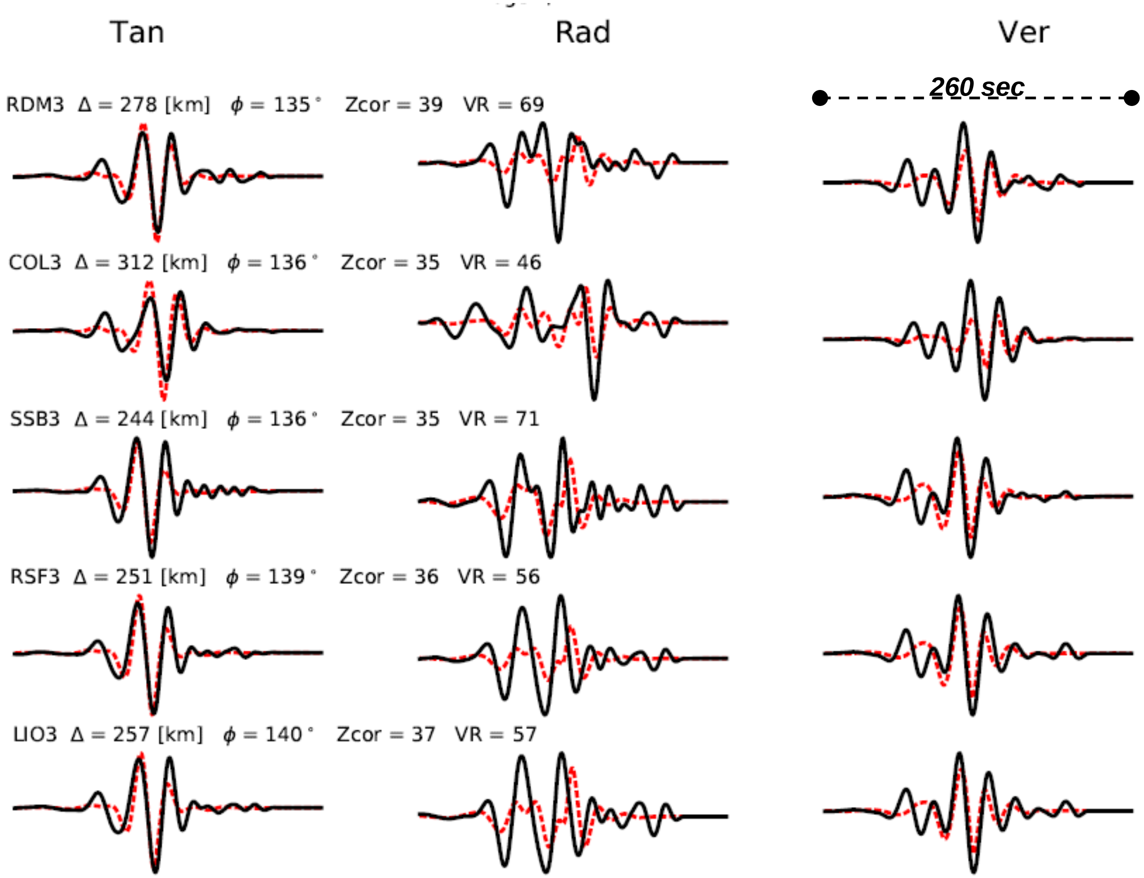
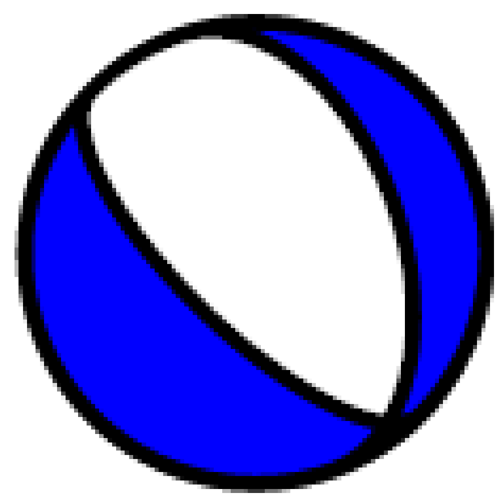
Focal Mechanism



The computed focal mechanism evidences a normal fault mechanism.

The two solutions are:
Str/dip/Slp:
134/60/76; 340/33/113
Mw = 6.11
Reduced Var.= 0.62



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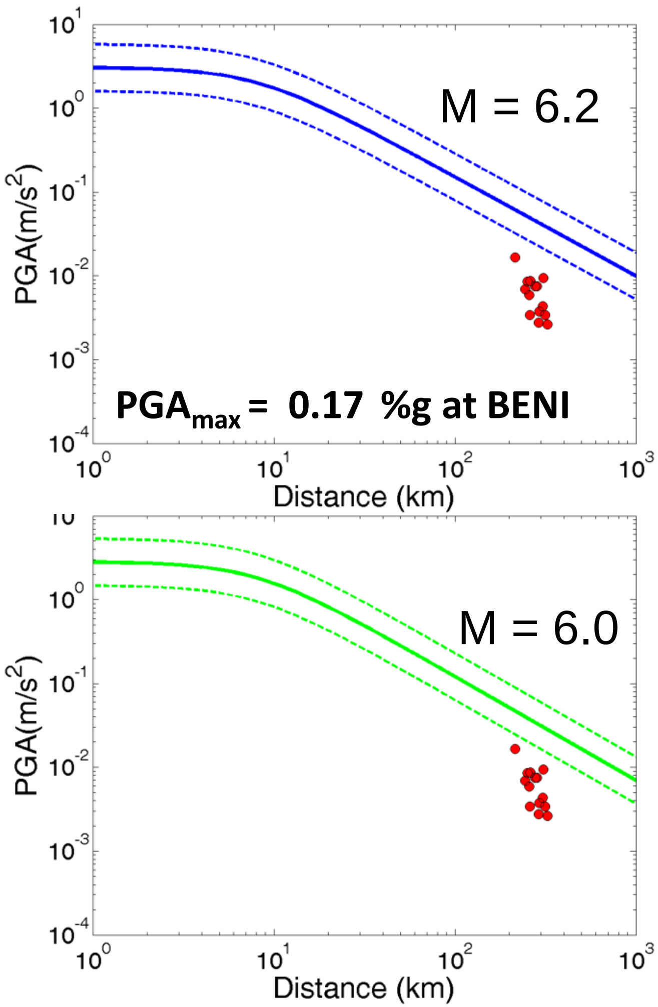
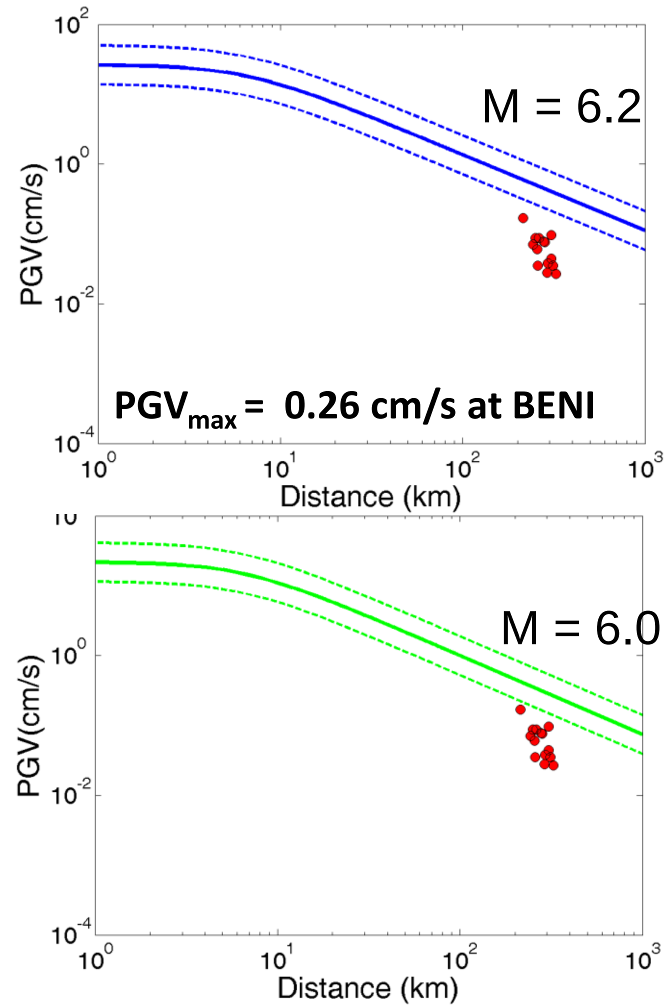
PGA and PGV



Observed PGA compored with Akkar and Bommer (2010), for M = 6.2 and M=6.0 events



Observed PGV compored with Akkar and Bommer (2010), for M = 6.2 and M=6.0 events

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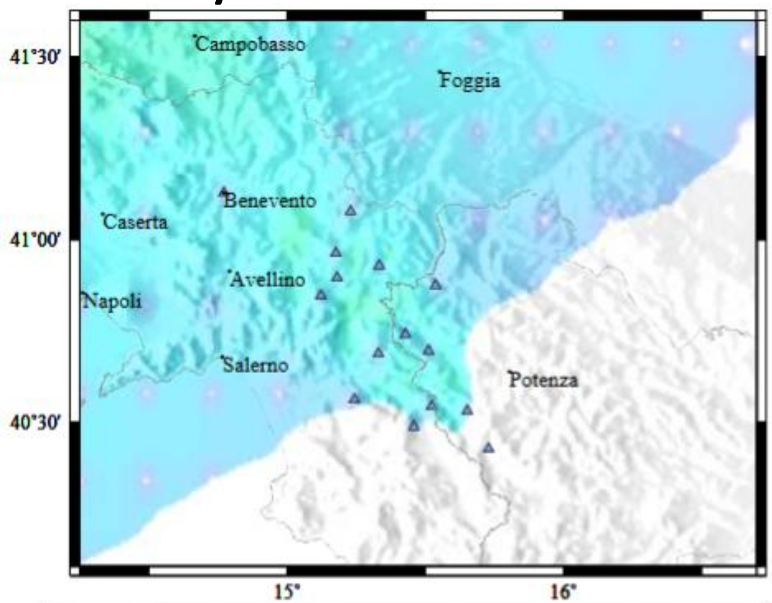
Shaking maps

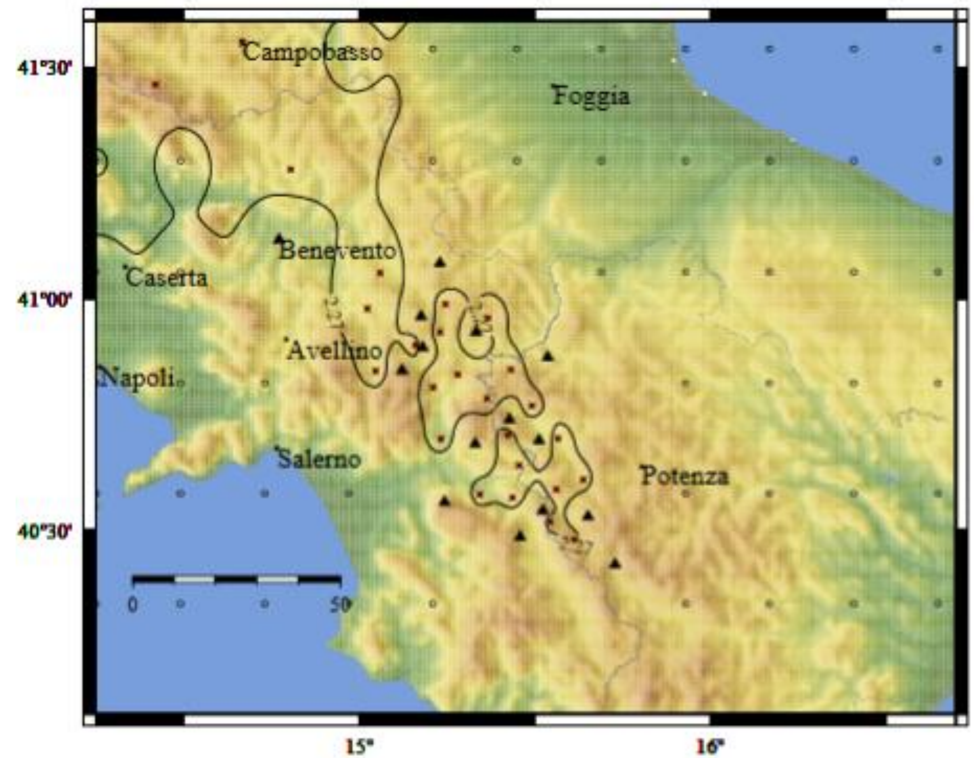
The largest PGA and PGV at ISNet were recorded at the station BENI (epicentral distance 215 km). The PGA was 1.7×10^{-1} %g whereas the PGV was 0.26 cm/s.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

Instrumental Intensity. It corresponds to the II-III degree of Modified Mercalli scale.



Shaking map based on PGA

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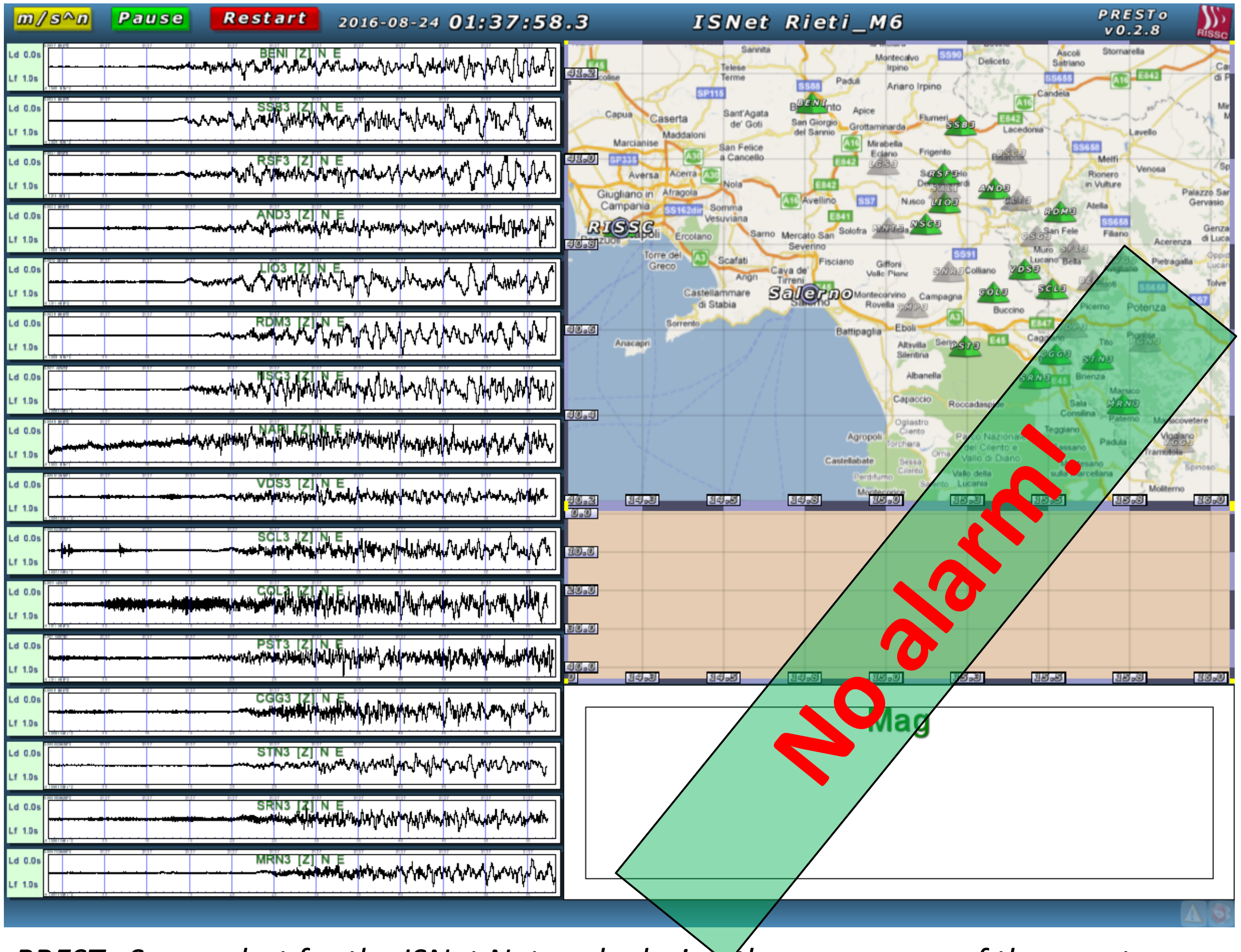
Performance of the PRESTo *Early Warning System*



PRESTo Screenshot for the ISNet Network, during the occurrence of the event

The Central Italy earthquake occurred ~280 km from ISNet; The P-wave arrivals were emergent and they did not meet the picking criteria. Hence the system did not issue an alarm for the Irpinia region.

It is worth to note that the present configuration of PRESTo is specifically designed for the detection of the events occurring within the area covered by ISNet

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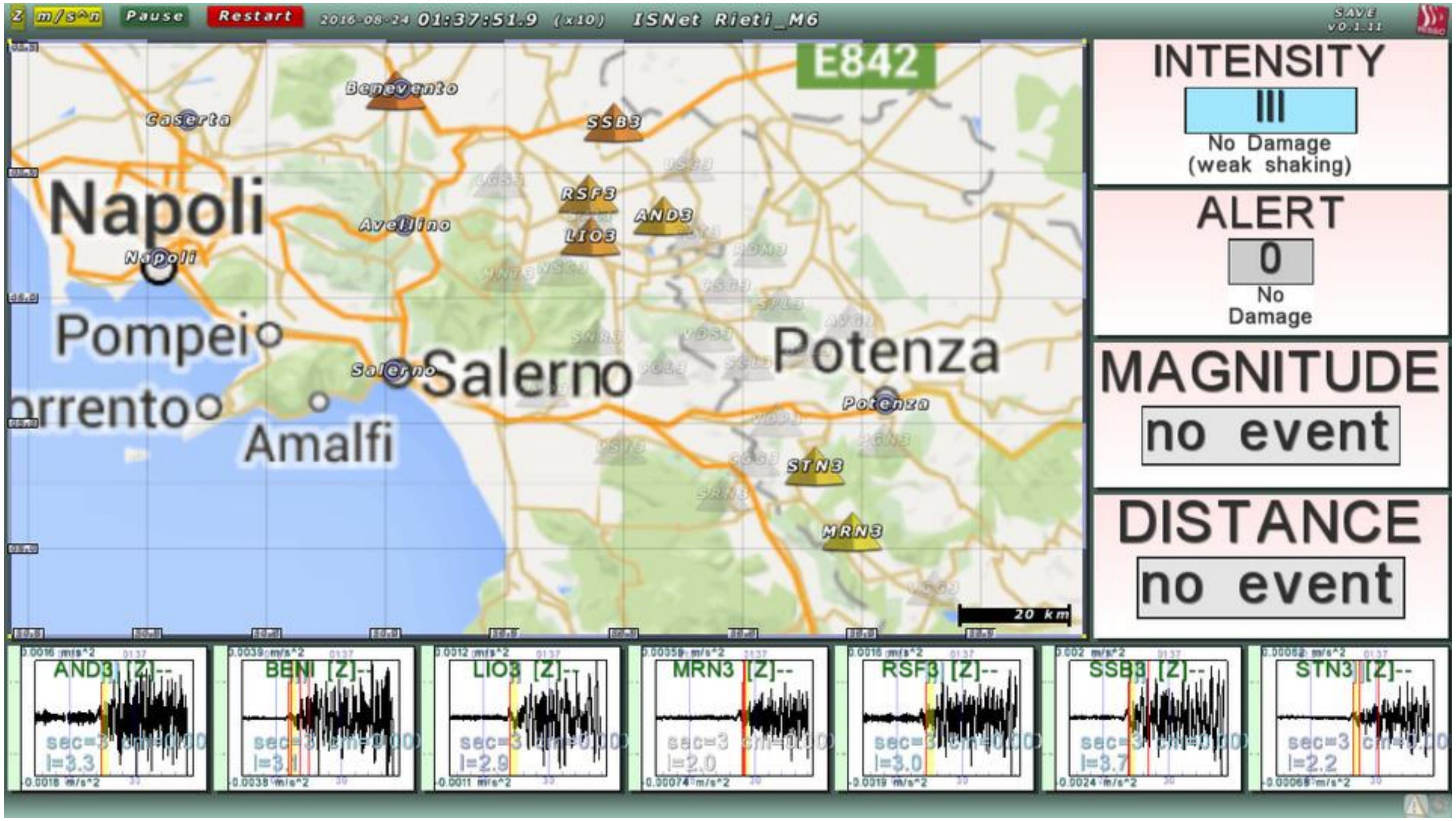
Performance of the SAVE *Early Warning System*



SAVE Screenshot at 7 stations of ISNet, during the occurrence of the event

The system detected an event with intensity going from 3.7 to 2.0, from North to South across ISNet. This corresponds to weak shaking and no damage. The system was not able to provide an estimation of the magnitude and the distance of the event as indicated on the right.

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Parameters computation

- Source parameters are computed fixing the location of the event at the epicenter as defined by the INGV
- Ml is computed using 14 stations and the law provided by of Bobbio et al. (2009)
- Mw and fc are obtained by the inversion of the displacement spectra at 11 stations (Zollo et al., 2014).
- Md is computed using 13 stations and the procedure described in Colombelli et al. (2014)
- Source radius and stress drop are computed from seismic momnet nad corner frequency using the Brune model.
- Focal mechanism is computed from inversion of the moment tensor using the TDMT program (Dreger et al., 2003) and 6 stations from ISNet, in the frequency band 0.02-0.05. The fit quality is Ab (Scognamiglio et al., 2009)

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Useful links:

ISNet Bulletin http://isnet.na.infn.it/cgi-bin/isnet-events/isnet.cgi

PRESTo Bulletin http://isnet.na.infn.it/PRESToWeb/Bulletin.php

ISNet http://isnet.fisica.unina.it/

RISSC-lab http://www.rissclab.unina.it/

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