

# Seismic sequence Rocca San Felice, South Apennines, Italy 04-06/07/2020

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Università degli studi  
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Irpinia Near-Fault  
Observatory



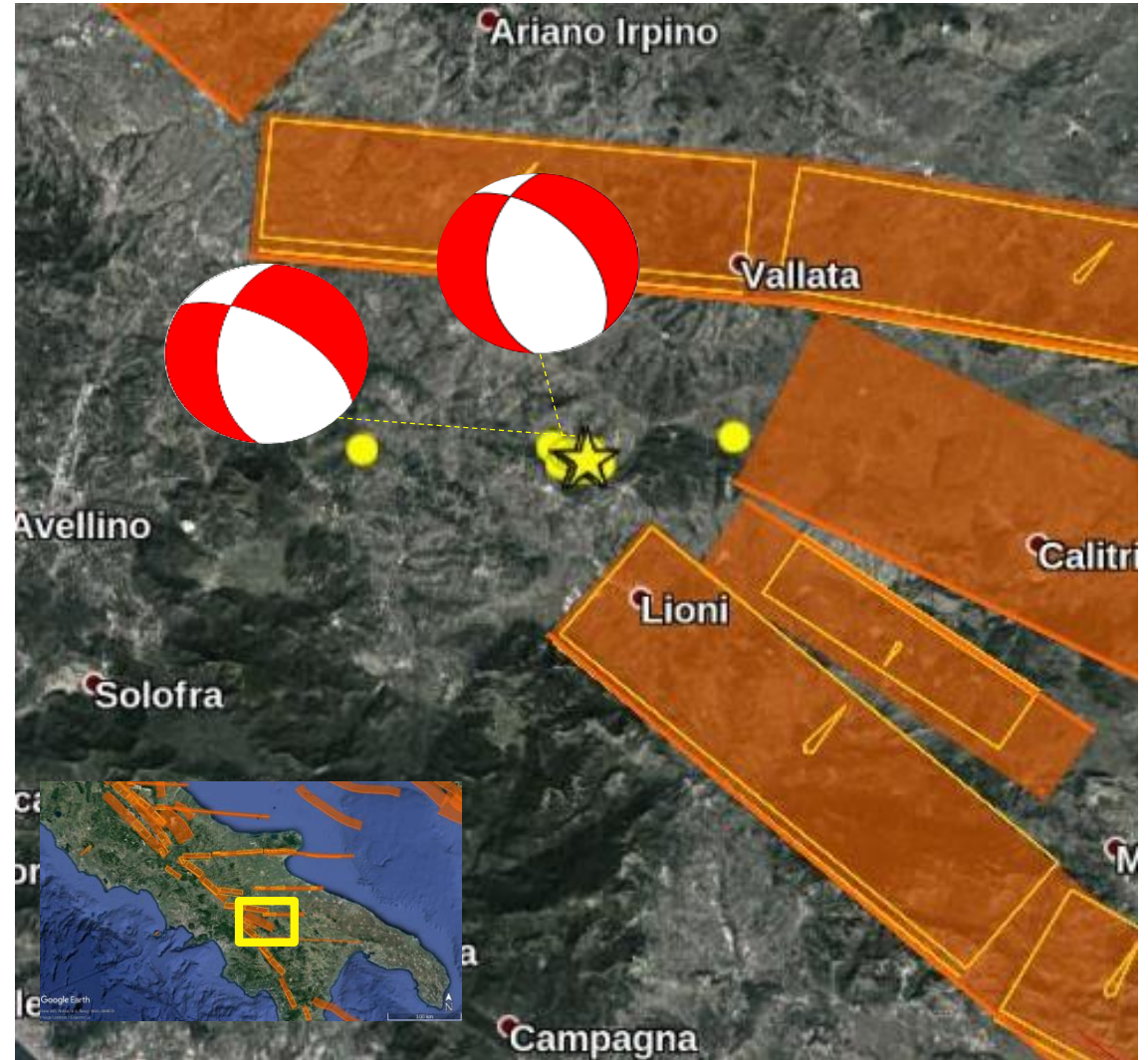
# The story of the sequence

A **seismic sequence** occurred in the **Irpinia region** (Southern Apennines, Italy) and was recorded by the Irpinia Seismic Network (**ISNET**), the core seismic infrastructure of **INFO** (Irpinia Near-Fault Observatory).

The sequence **started on July 3**, with two  $M_L \sim 3$  events occurred within a five minute delay from each other and **lasted two days**. We recorded **338 events**, ranging from M -1 to M 3.

Events in the sequence with larger magnitude have been located on a **NE dipping fault**, with a **dip in the range 45°-55°**. The fault strike is along the Apennine direction.

The sequence occurred **north of the 1980 main fault segment** at a depth of **10-12 km**. The focal mechanism indicates a **normal kinematics** with a small strike-slip component.



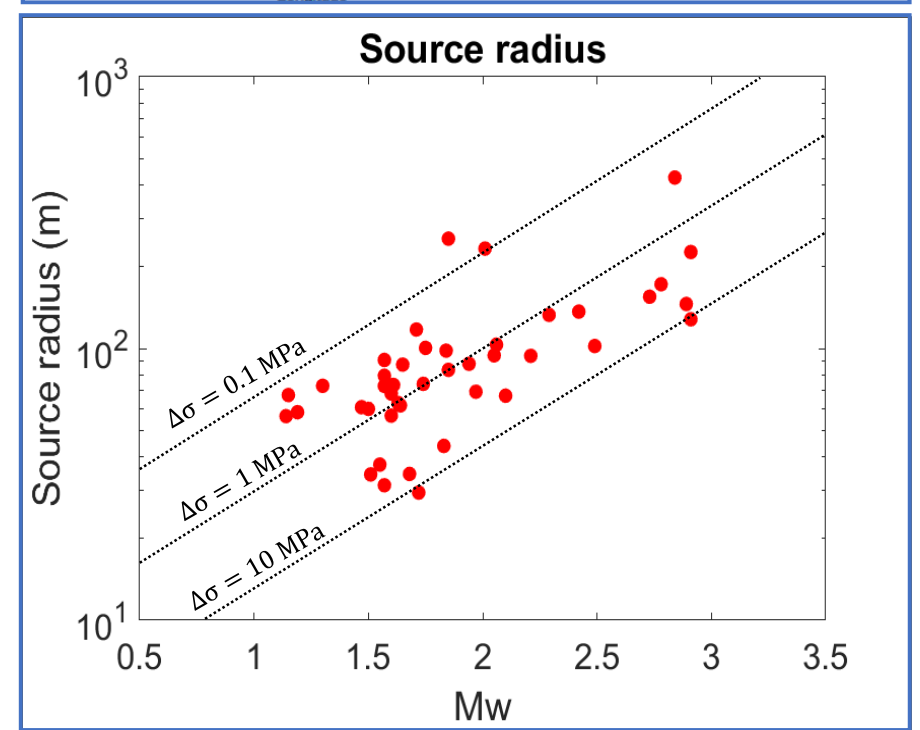
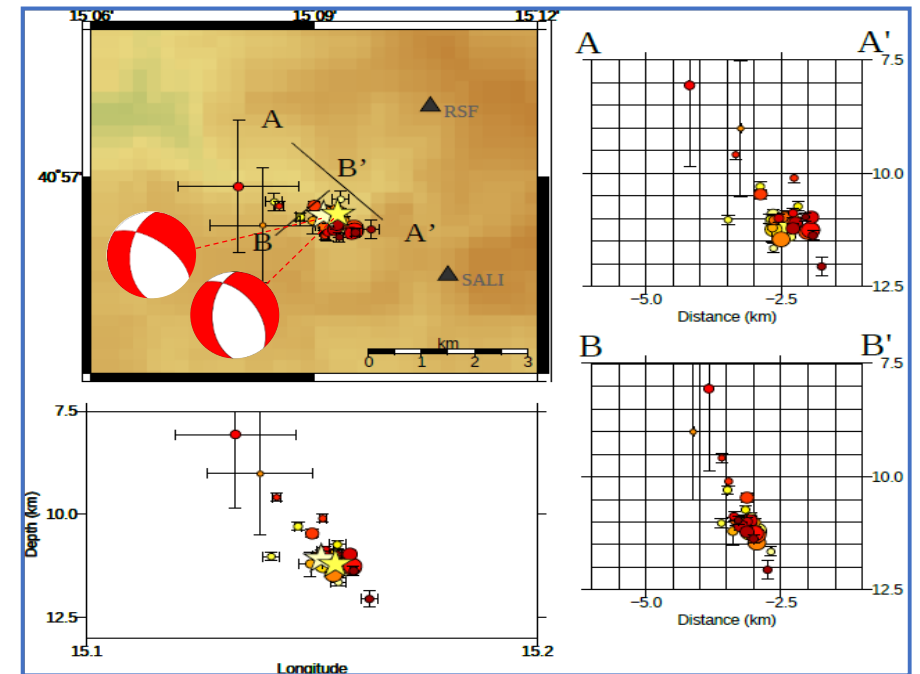
# Insight into the source processes

Source parameters indicate an average **stress drop** of about **0.64 MPa**, while **M>2** events show an average stress drop of **1.0 MPa**, coherently with previous estimates in the area.

**Source radius** of main events points to an extension of about **1.0-1.5 km**, while a size of 2.5 km can be accommodated by a **M 4.2 event** with a stress drop of 1.0 MPa. The total cumulative moment of the sequence **yields M 3.5**.

We retrieve **low seismic efficiency** and **low scaled energy**, likely leading to large fracture energy.

The b-value of the sequence is **b=0.75** smaller than the value of 1.0, found for background seismicity in the area. The sequence ruptured a region on the fault of a size of about **2.5 km**.



# Peak Ground motion and Early Warning

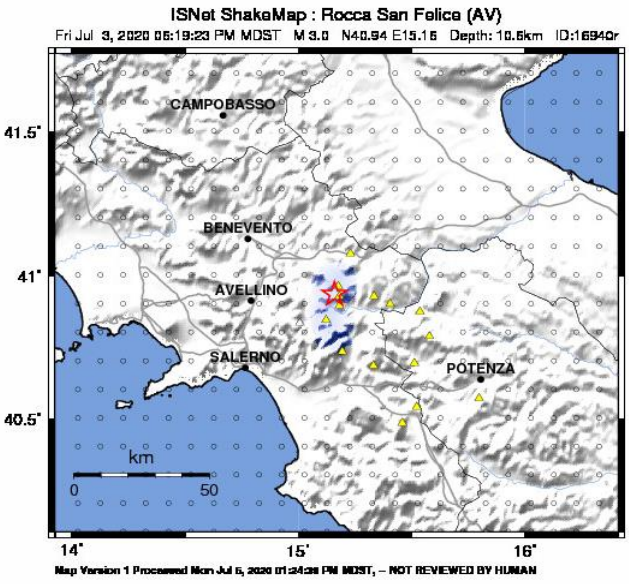
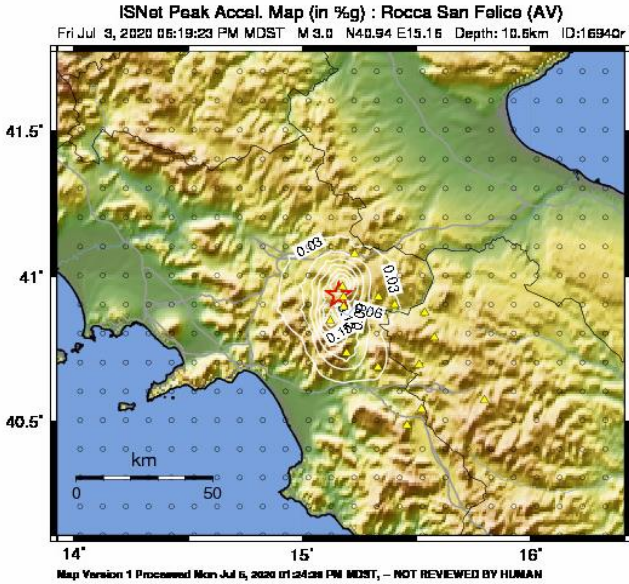
Ground motion intensity IV has been reached during the  $M_L \sim 3$  event at the near site of Rocca San Felice.

The recorded PGA was 0.5%g. Variability in the ground motion is ascribed to variability in stress drop, focal mechanism and path.

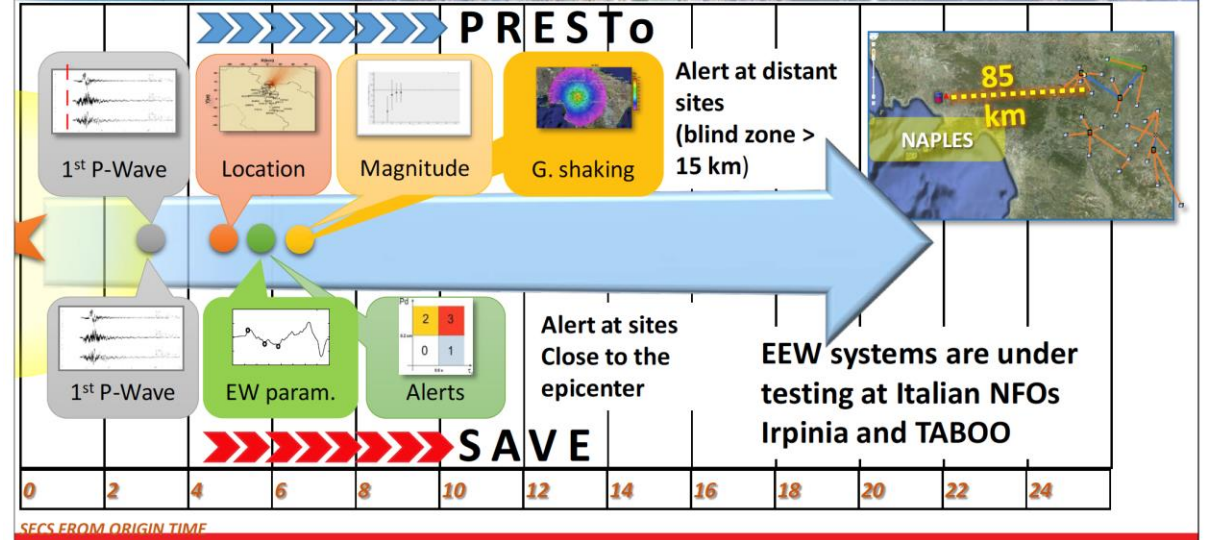
The Regional Early Warning system PRESto has provided notifications for 21 events in the sequence, with an average first-alert time of 3.9s, with a lead-time of 4s at Avellino and 16s at Napoli.

The Onsite Early Warning system SAVE has provided 23 triggers at the closest station RSF, with an overall successful prediction of the intensity at the site.

The Early Warning App has notified the alert to 7 lab members who are testing the app.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.17	0.17-1.4	1.4-3.0	3.0-6.2	6.2-16	16-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-18	18-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



## **More info**

Technical details and additional information can be found at the link

[http://isnet.unina.it/wp-content/uploads/2020/07/Sequence\\_July20\\_fullReport.pdf](http://isnet.unina.it/wp-content/uploads/2020/07/Sequence_July20_fullReport.pdf)