

Supporting Information for

## **Characterization and evolution of seismic sequences in the normal fault environment of the Southern Apennines**

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Table S1

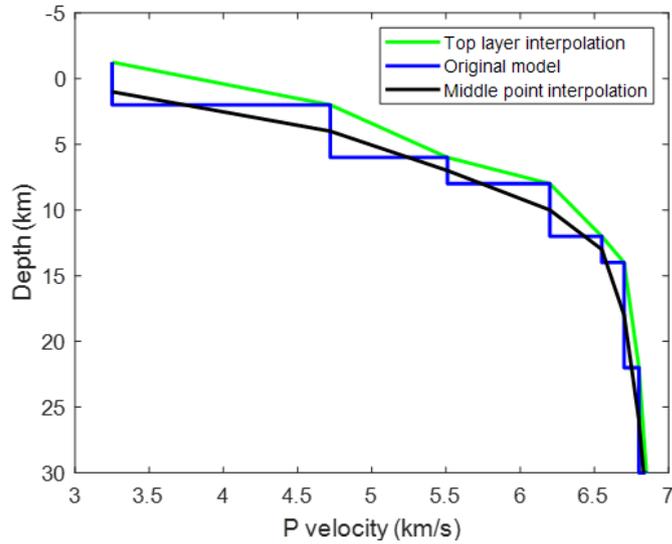
Figure S1, S2, S3

### **Introduction**

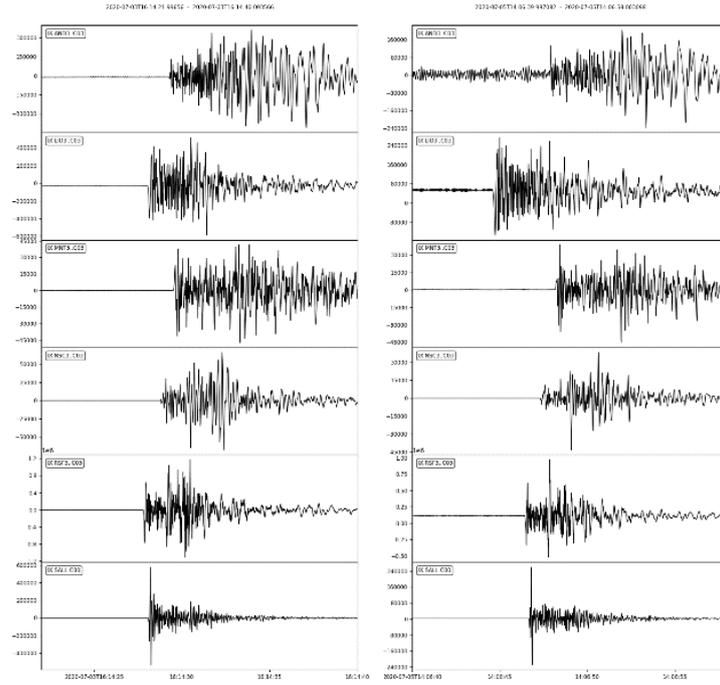
In the Supporting Information we report the sequence labelling using in this study with respect to the sequence indexing in Scotto di Uccio et al. (2023) (Table S1), the velocity models that have been tested for earthquake location (Figure S1), the waveforms from two events belonging to the two clusters identified from the Rocca San Felice seismic sequence (Figure S2) and the results for the spectral inversion using different attenuation factors (Figure S3)

Sequence location	$M_{l_{main}}$	IDX in this study	IDX in Scotto di Uccio et al. (2023)
Lioni (AV)	2.7	1	2
San Gregorio Magno (SA)	2.8	2	3
Lioni (AV)	3.7	3	4
Laceno (AV)	1.8	4	5
Ricigliano (SA)	3.0	5	6
Lioni (AV)	2.8	6	8
Bella (PZ)	3.1	7	10
Rocca San Felice (AV)	3.0	8	1

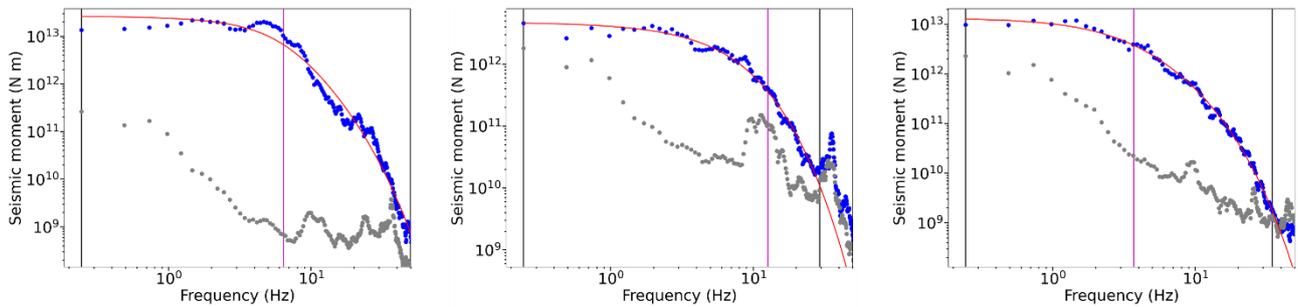
**Table S1:** Sequence labelling using in this study with respect to the indexing in Scotto di Uccio et al. (2023)



**Figure S1:** P wave velocity models tested for earthquake location. Starting from the 1D layered velocity model (blue line, Matrullo et al. 2013) we derived two gradient models, which smooth the discontinuities in the wave velocity across layer boundaries, by linearly interpolating values between either the top (green line) or the middle points (black line) of the layers.



**Figure S2:** Vertical component of ground motion records (velocity for stations AND3, LIO3, MNT3, NSC3, RSF3, acceleration for station SALI) for two events belonging to the two clusters identified in the Rocca San Felice seismic sequence (IDX 8). Traces are bandpass filtered between [1 – 20] Hz. The two events differ for the station recording the first P-wave arrival: for the event belonging to the first cluster (left panel) the first P-wave arrival is observed at RSF3 while for the second cluster (right panel) the first P-wave arrival is recorded at LIO3.



**Figure S3:** Spectral inversion of a  $M_1 = 2.8$  earthquake using different attenuation factors for the stations. Left panel: inversion using  $Q_{EGF}$  at NSC3 station. Central panel: inversion using  $Q_{LOC}$  at SCL3 station. Right panel: inversion using  $Q_{REG}$  at VDS3.