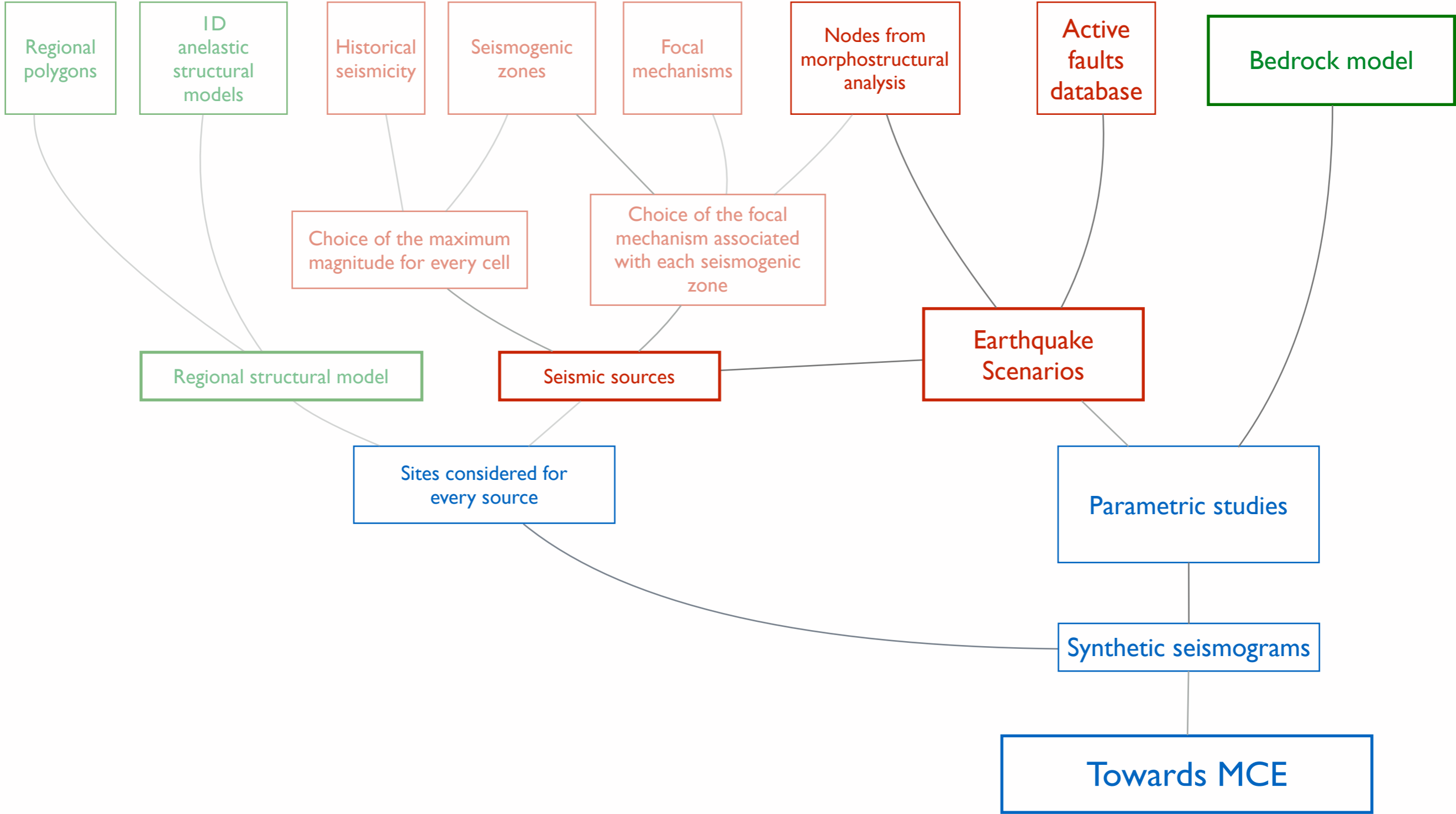


# Local Scale - Towards MCE

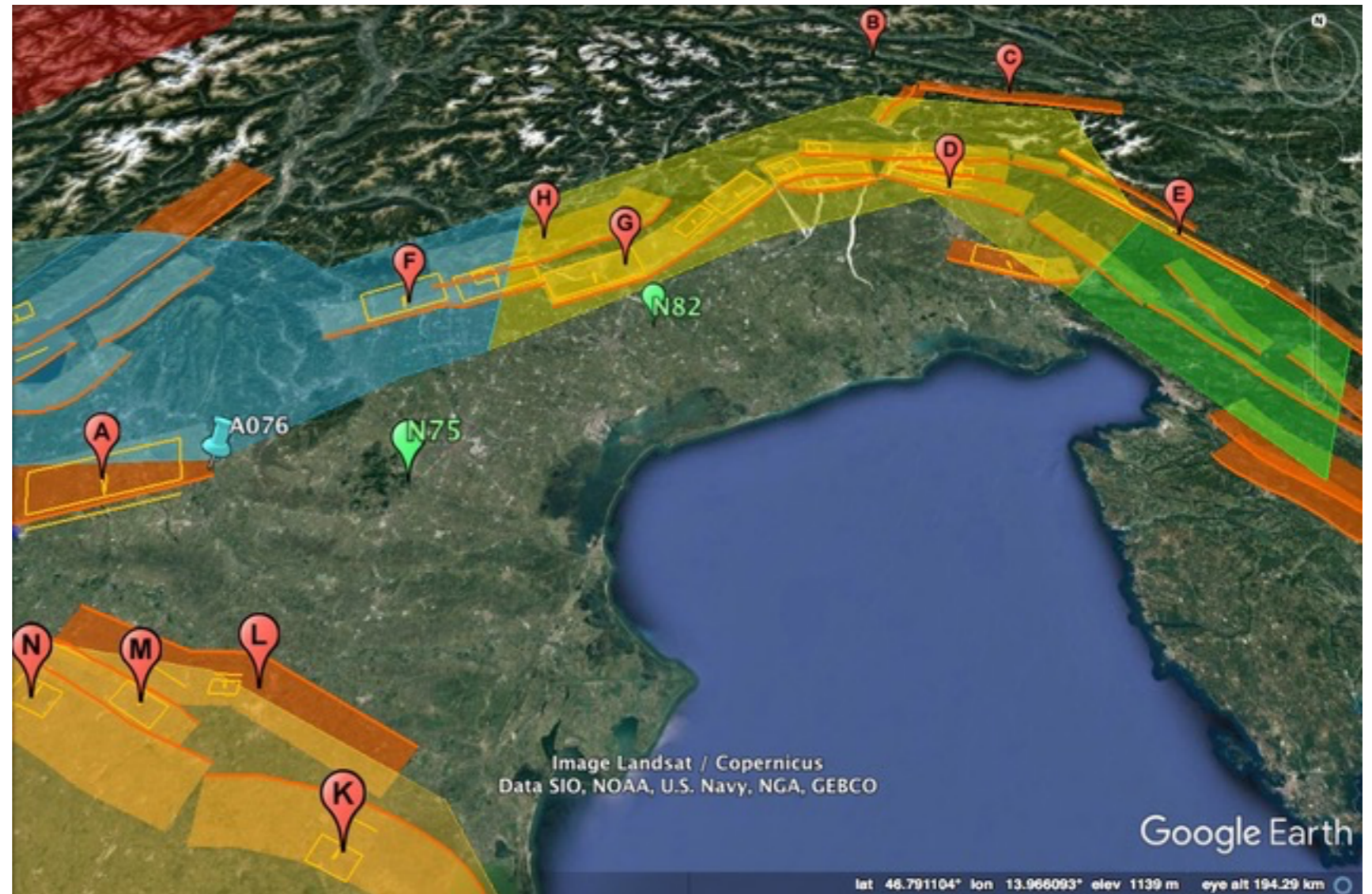
## Regional scale

## Local scale



# Scenario sources

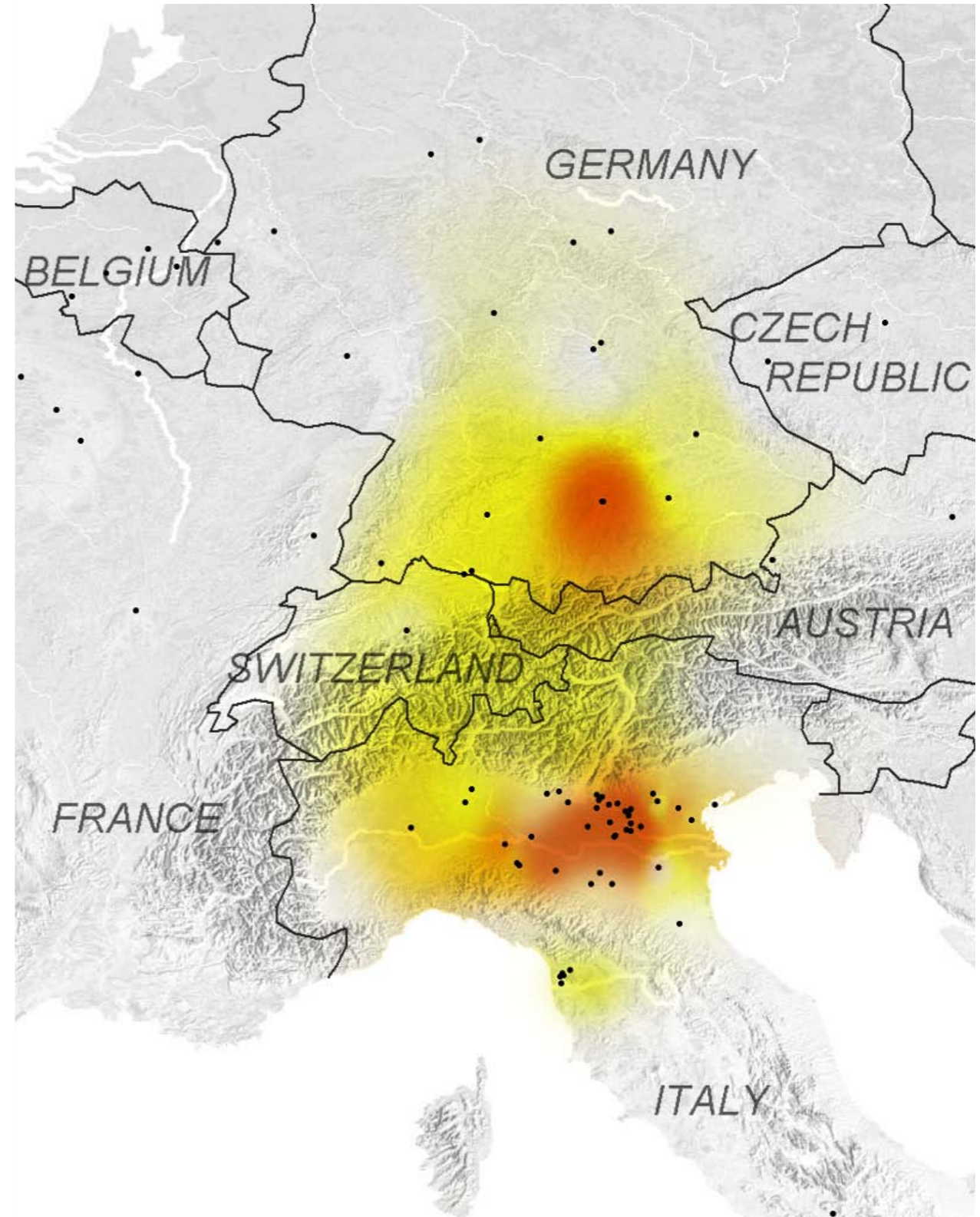
- ZS9
- MSZ
- DISS



DISS Working Group (2015). Database of Individual Seismogenic Sources (DISS), Version 3.2.0: A compilation of potential sources for earthquakes larger than M 5.5 in Italy and surrounding areas <http://diss.rm.ingv.it/diss/>

# Local Scale - 1117 Earthquake

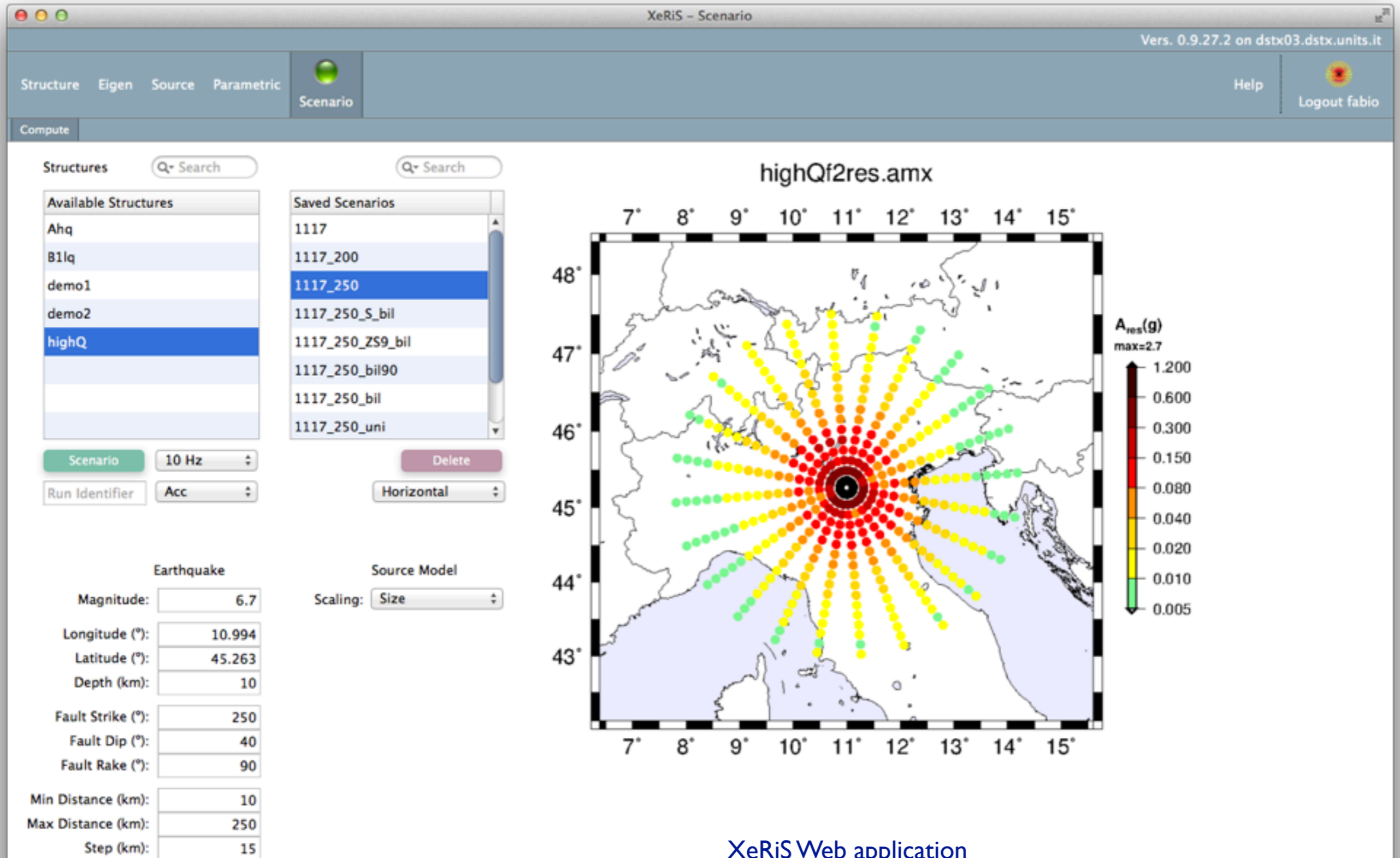
The “exceptional” earthquake of  
3 January 1117  
in the Verona area (northern Italy)  
(10 IX MCS, M 7.0)



# Local Scale - 1117 Earthquake

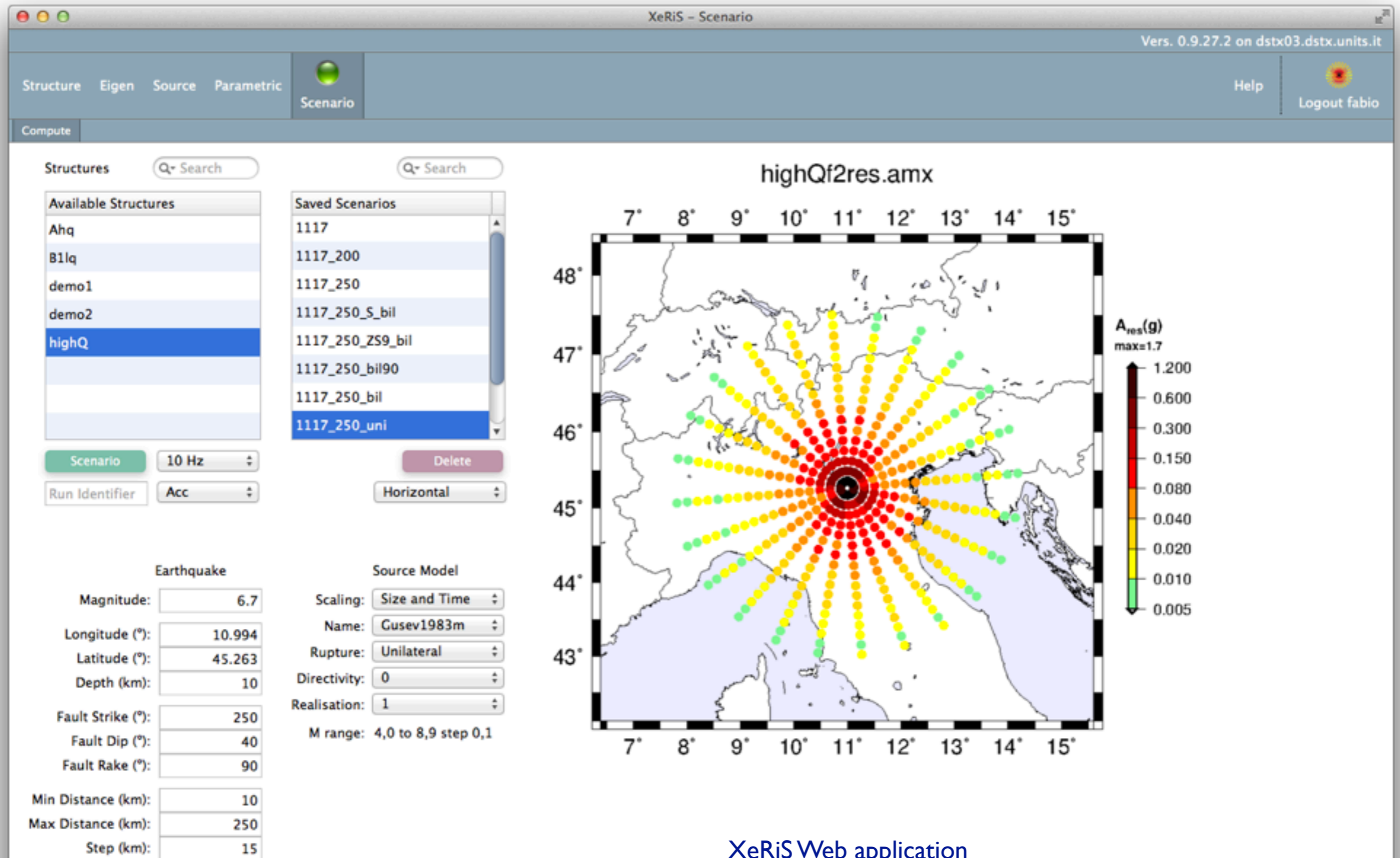
- The source of this event can be identified with the individual ITIS140 or the composite ITCS076. The nearest seismogenic node is A80 node [Gorshkov et al., 2004, 2009], which is located at a distance (30 km) greater than the radius of the node (25 km).
- We have used the source parameters as DISS 3.1, EDSF, the A80 node, the seismogenic zone ZS906 and the parameters that gave the best solution in Zuccolo [2010].

# Local Scale - 1117 scenario ITCS076



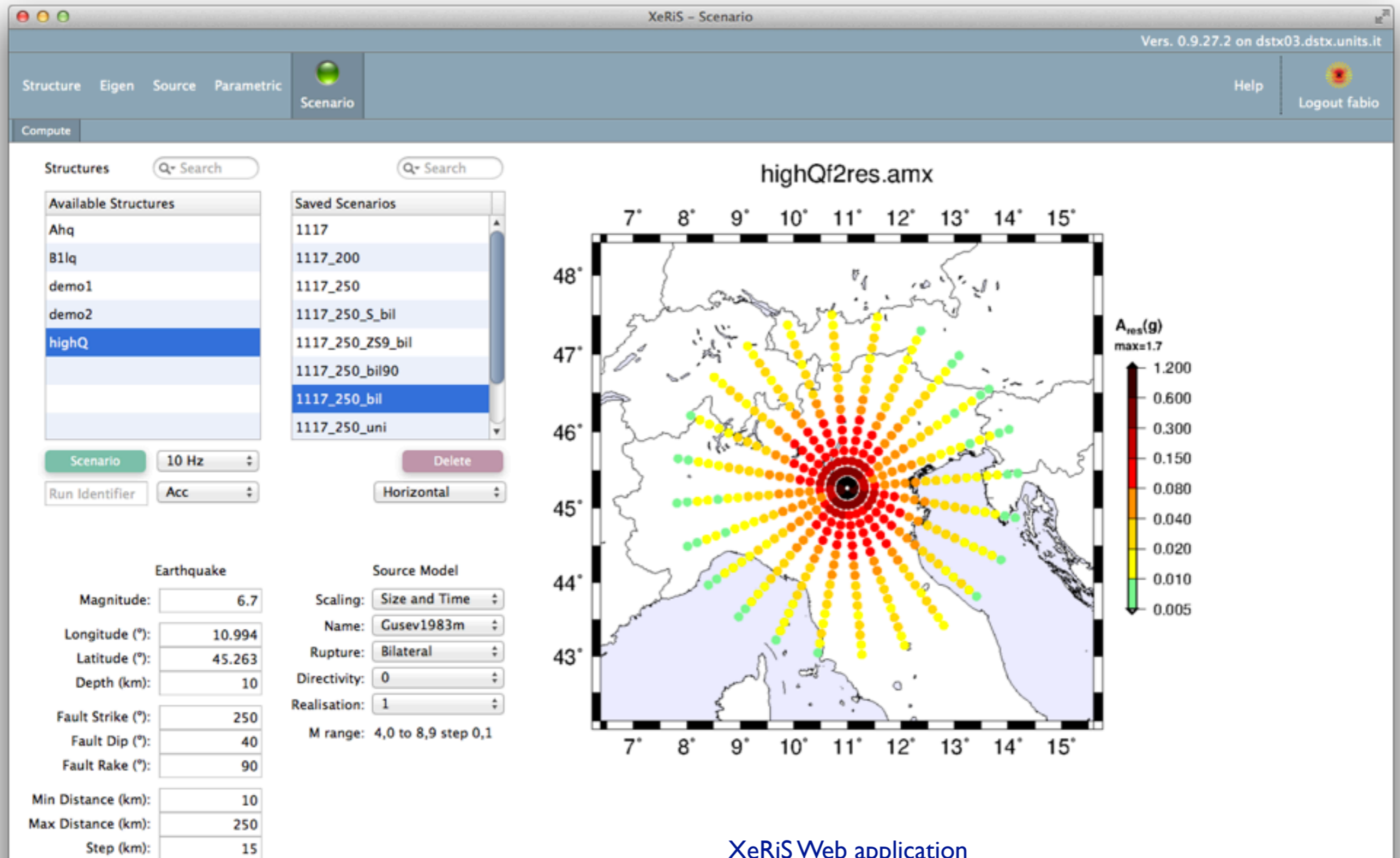
XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

# Local Scale - 1117 scenario unilateral



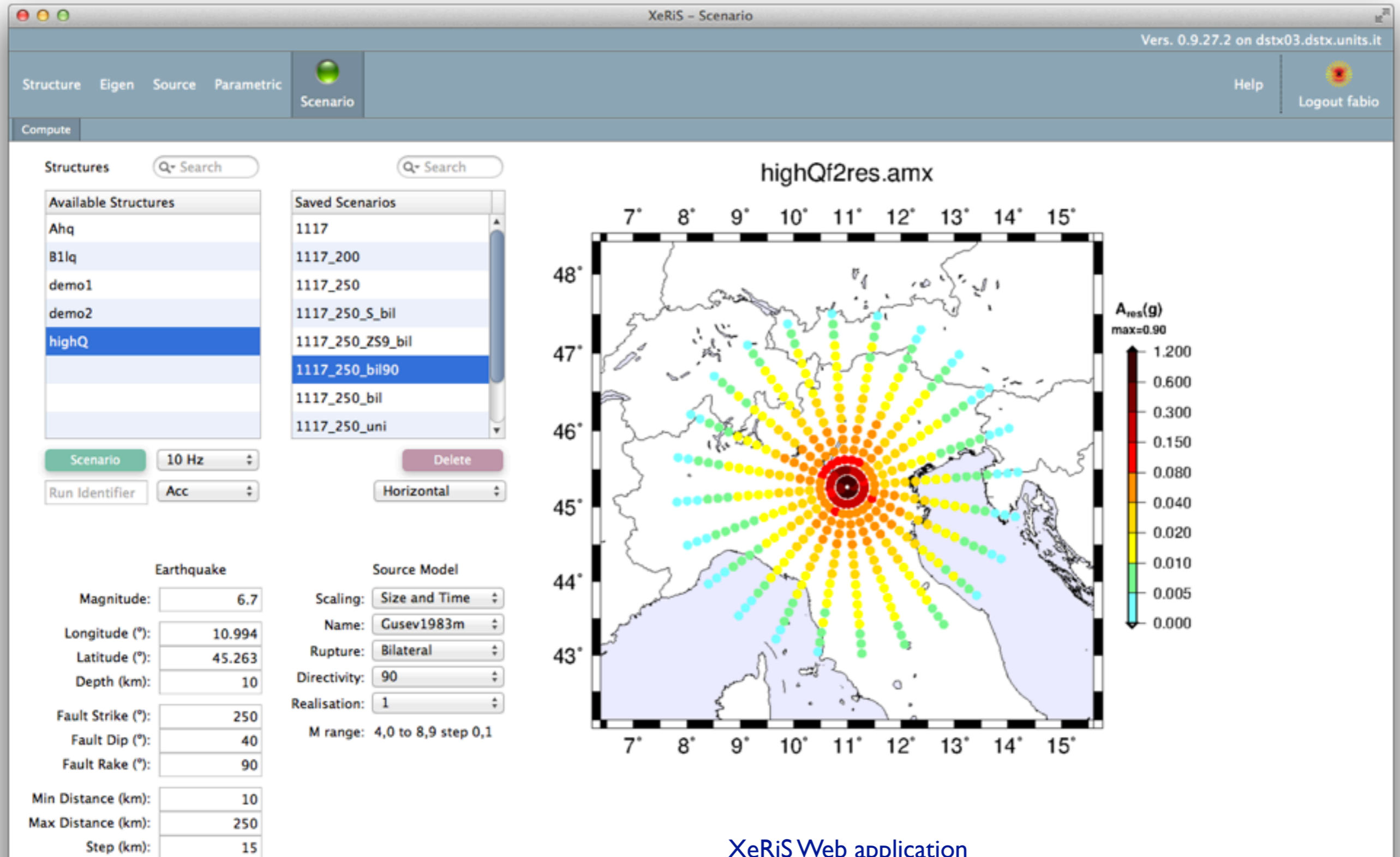
XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

# Local Scale - 1117 scenario bilateral



XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

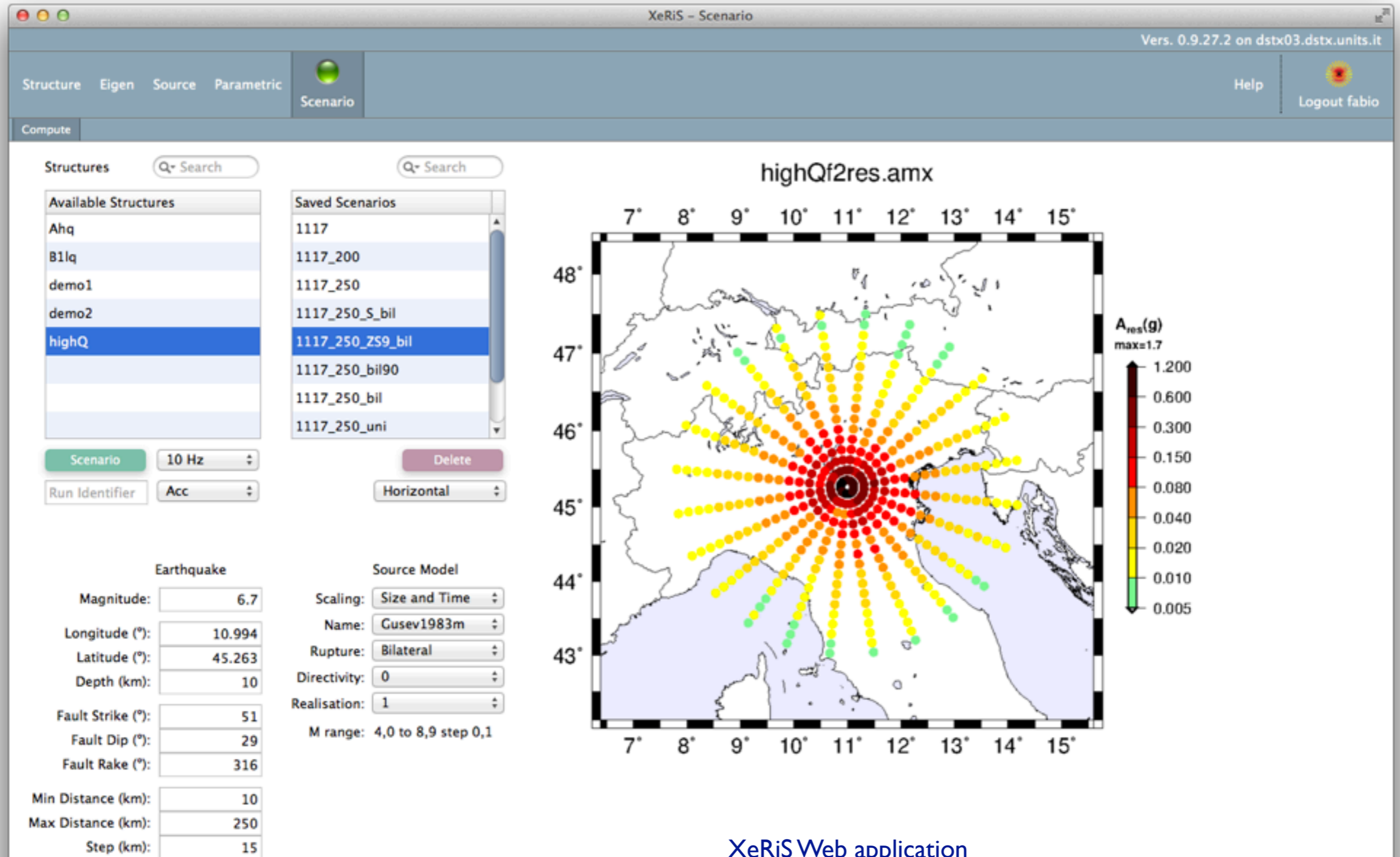
# Local Scale - 1117 scenario bilateral 90°



XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

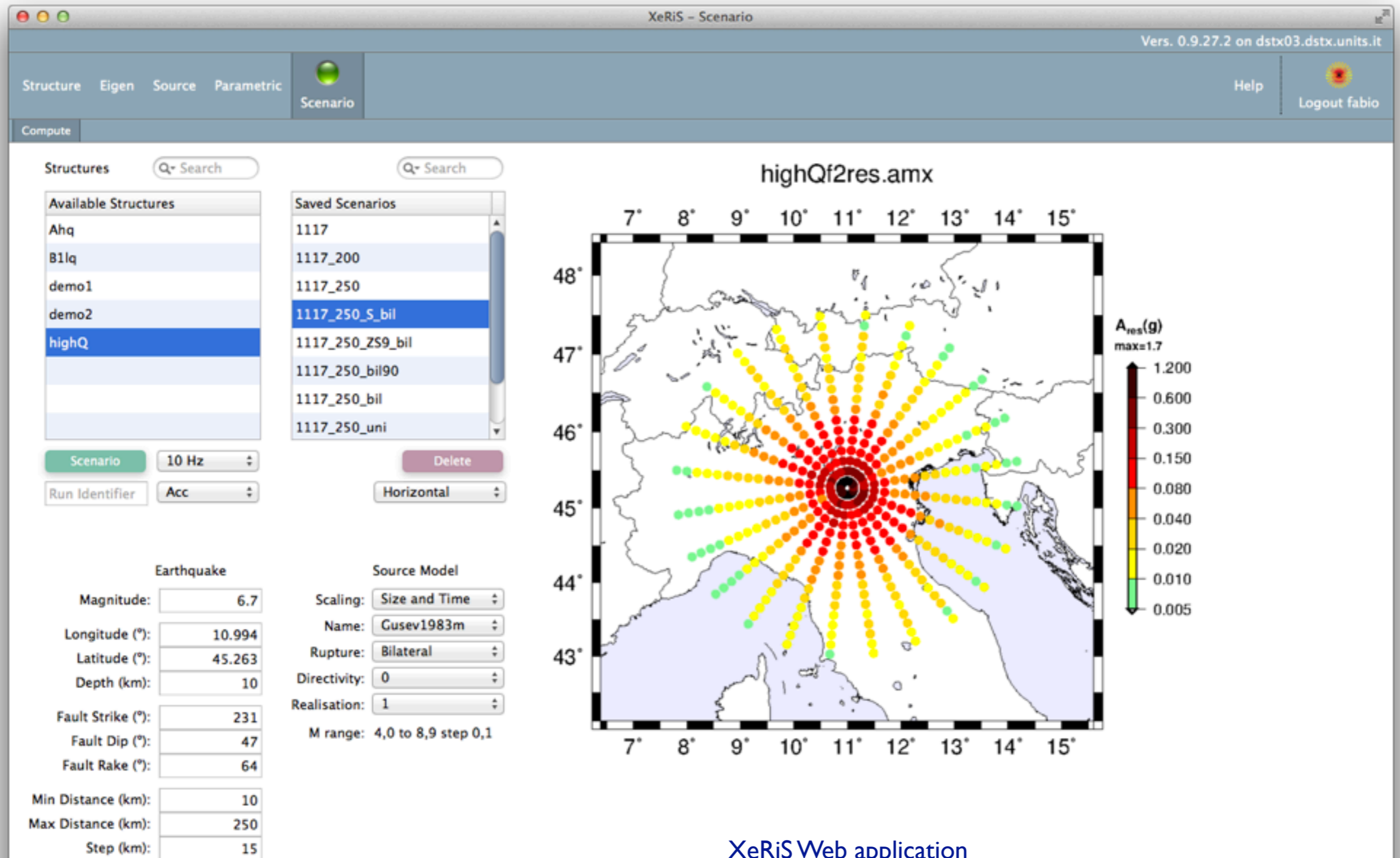


# Local Scale - 1117 scenario Z69



XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

# Local Scale - 1117 scenario Salò



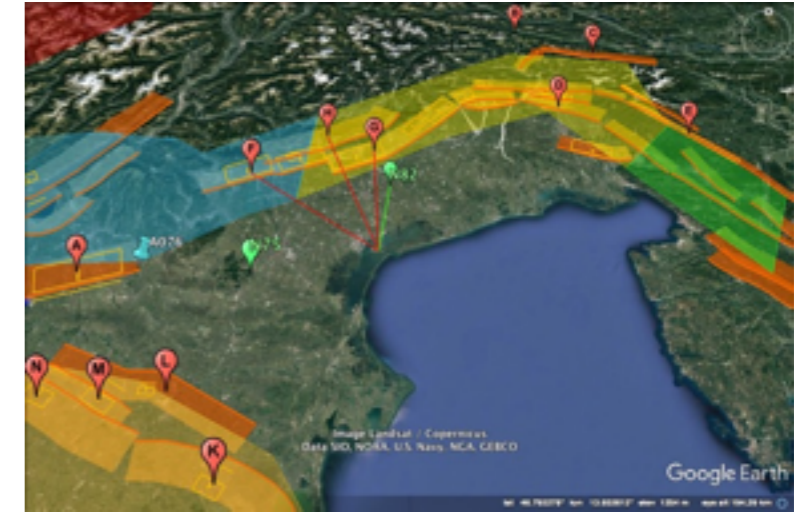
XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

# Local Scale - BNM & SGO

CONVENZIONE  
per il supporto alla  
gestione delle attività  
legate al miglioramento  
sismico di edifici  
monumentali

Segretariato Regionale  
Veneto MiBACT

DMG-UNITS

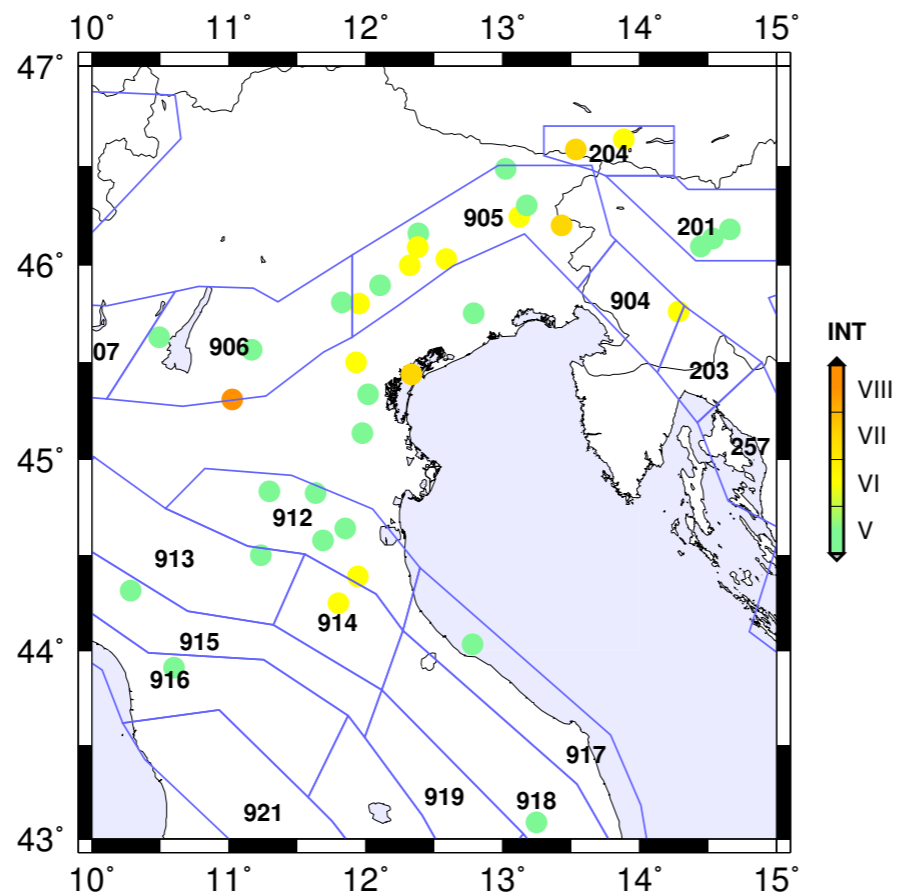


San Giacomo dell'Orio

Biblioteca Nazionale Marciana

# Seismogenic sources

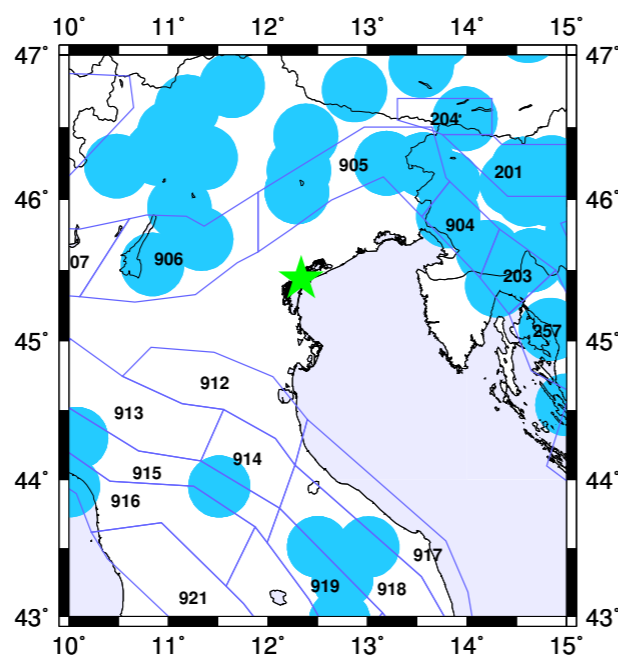
 **ZS9**



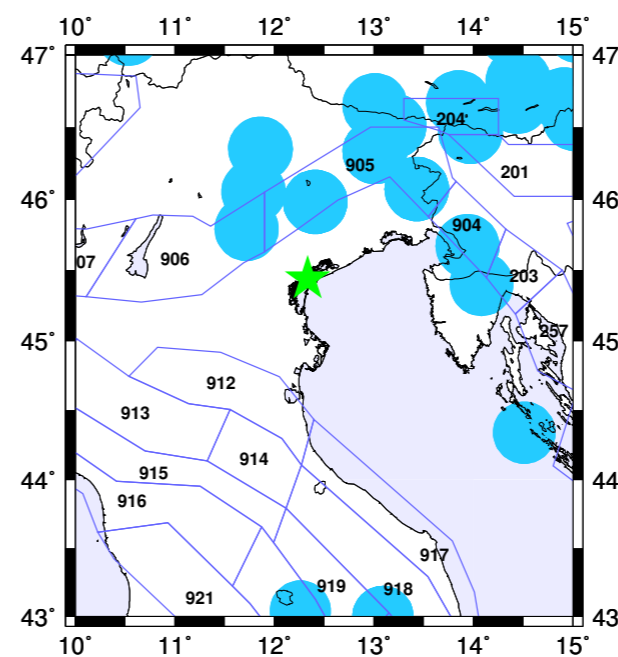
Locations of events that caused  
IMCS  $\geq$  V in Venezia and  
seismogenic zones ZS9

<http://emidius.mi.ingv.it/CPTII5-DBMII5/>  
Meletti e Valensise, 2004

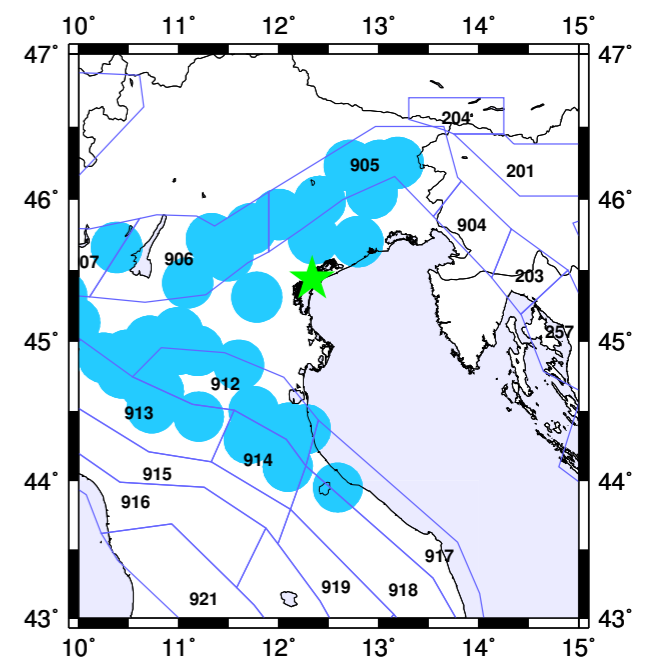
 **MSZ**



**M > 6.5**



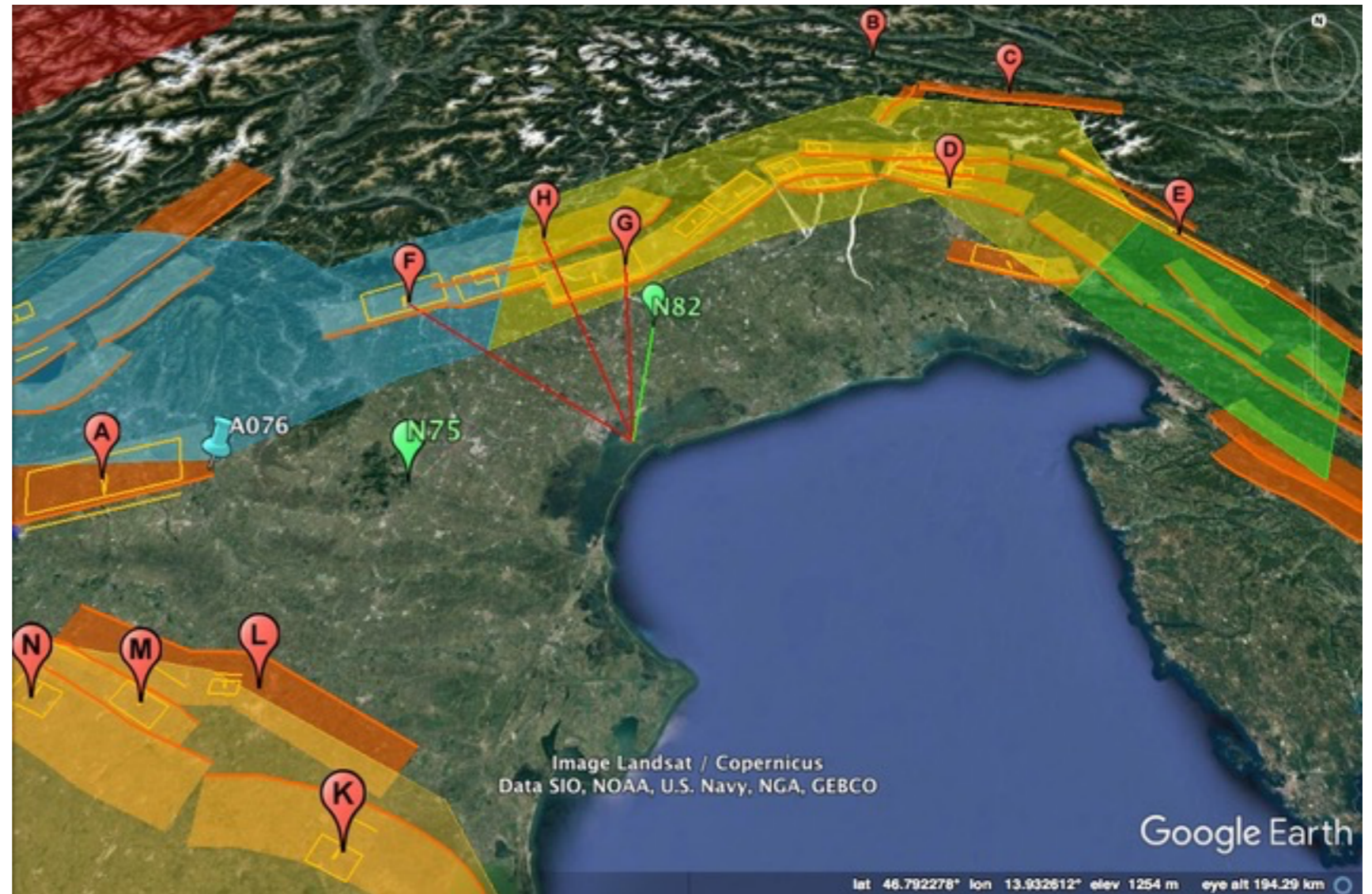
**M > 6.0**



**M > 5.5**

# Local Scale - Scenario Earthquakes (Venice)

- ZS9
- MSZ
- DISS



DISS Working Group (2015). Database of Individual Seismogenic Sources (DISS), Version 3.2.0: A compilation of potential sources for earthquakes larger than M 5.5 in Italy and surrounding areas <http://diss.rm.ingv.it/diss/>

# Scenario Earthquakes

<p>A. ITCS076 Adige [ZS906] (Veronese 1117-01-03, IMCS = 7 - 8)</p>
<p>B. ATCS010 Western Periadriatic [ZS204] (Villach – Carinzia 1348-01-25, IMCS = 7)</p>
<p>C. ITCSI02 Tarvisio [ZS204] (Villach – Carinzia 1348-01-25, IMCS = 7)</p>
<p>D. ITCS066 Gemona – Tarcento [ZS905] (Slovenia 1511-03-26, IMCS = 7)</p>
<p>E. SICS002 Tolmin – Idrija [ZS904] (Slovenia 1511-03-26, IMCS = 7)</p>
<p>F. ITCS007 Thiene – Cornuda [ZS905] (Asolano 1695-02-25, IMCS = 6)</p>
<p>G. ITCS060 Montebelluna – Montereale [ZS905] (Sequals 1812-10-25, IMCS = 6)</p>



<p>H. ITCSI05 Bassano – Vittorio Veneto [ZS905] (Bosco Cansiglio 1936-10-18, IMCS = 6)</p>	<p>K. ITCS012 Malalbergo – Ravenna [ZS912]</p>
<p>I. ITCS011 Ascensione – Armaia [ZS912] (Romagna 1688-04-11, IMCS = 6)</p>	<p>L. ITCS050 Poggio Rusco – Migliarino [ZS912]</p>
<p>J. ITCS001 Castel S. Pietro T. – Meldola [ZS914] (Romagna 1781-04-04, IMCS = 6)</p>	<p>M. ITCSI03 Finale Emilia – Mirabello [ZS912]</p>

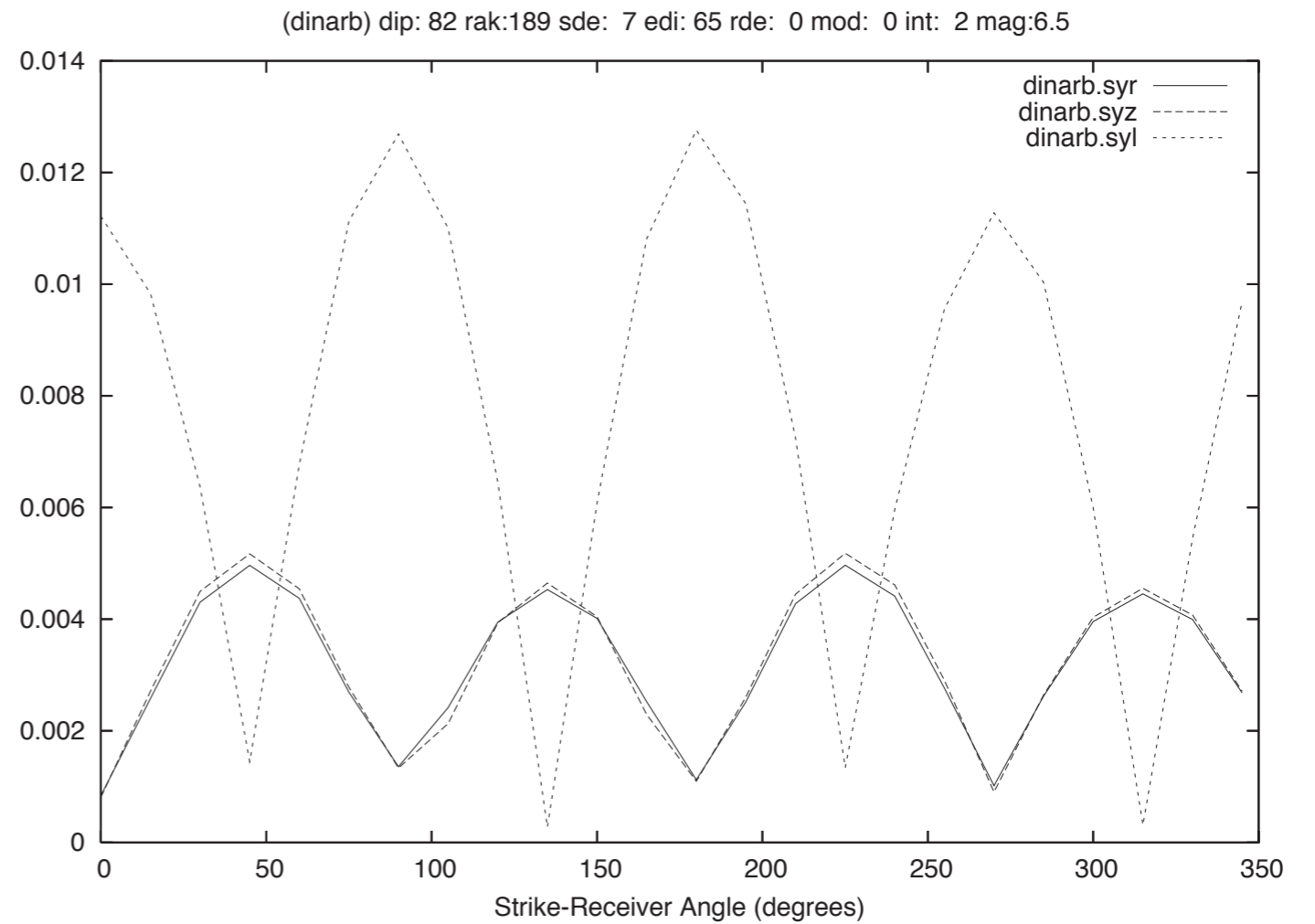
# Local Scale - Preliminary Parametric Test

● Radiation Pattern

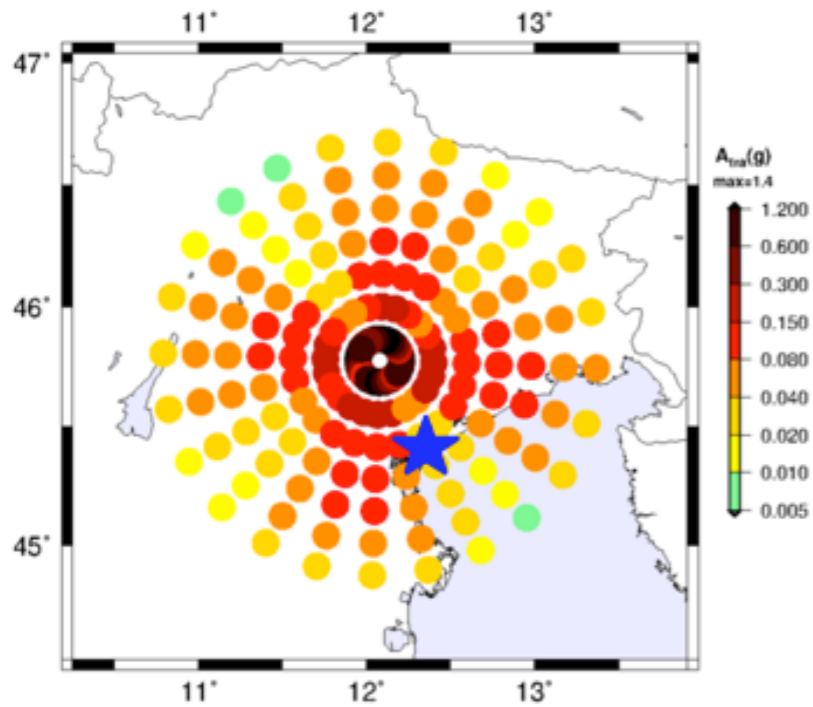
● Source Depth

● Epicentral Distance

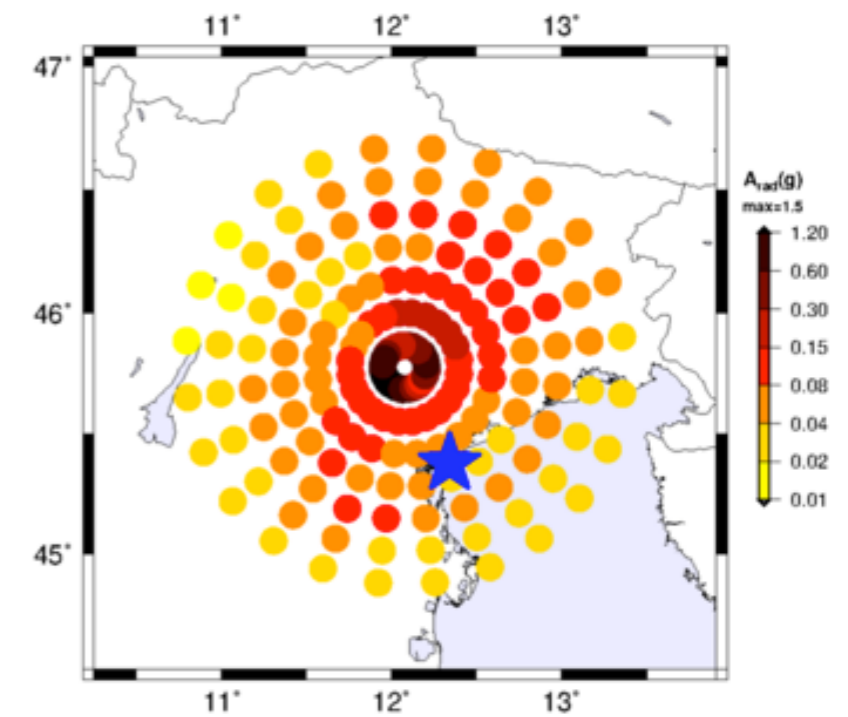
● .....



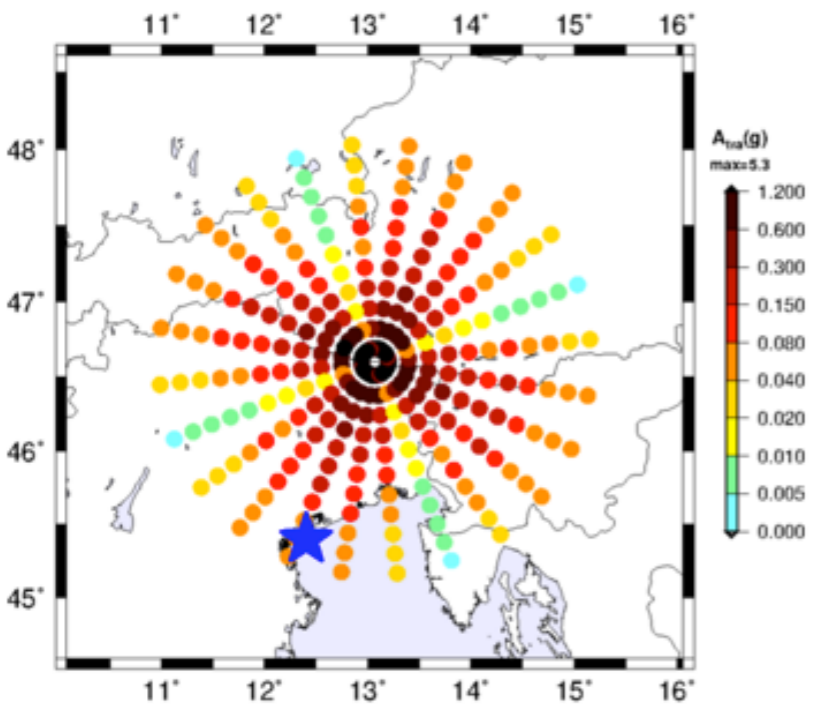
# Local Scale - Scenarios A and B



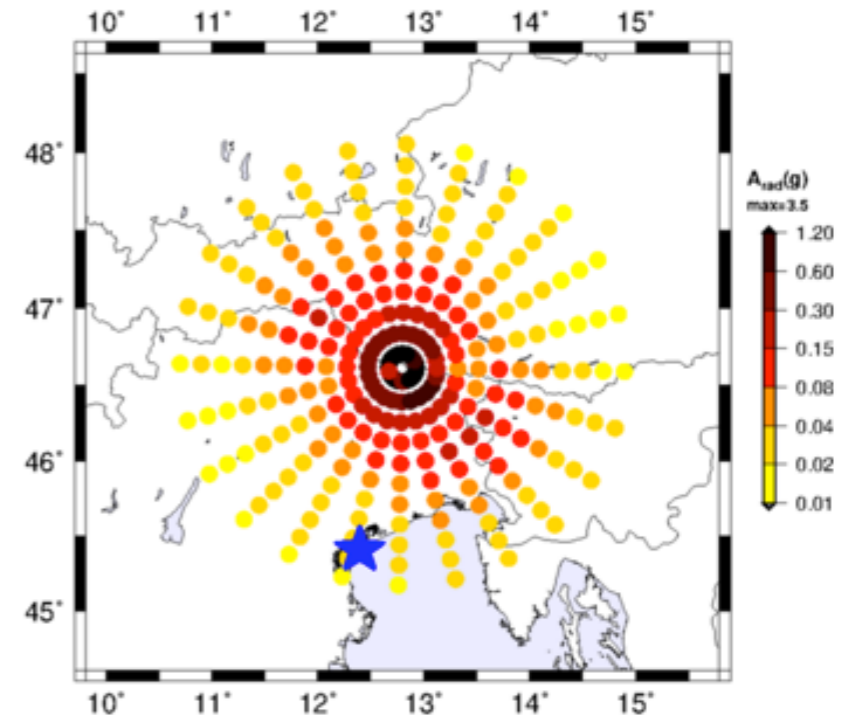
A	Rake (°)	Dip (°)	Strike (°)	D (km)
R	80	30	180	85
T	100	30	200	85



XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>

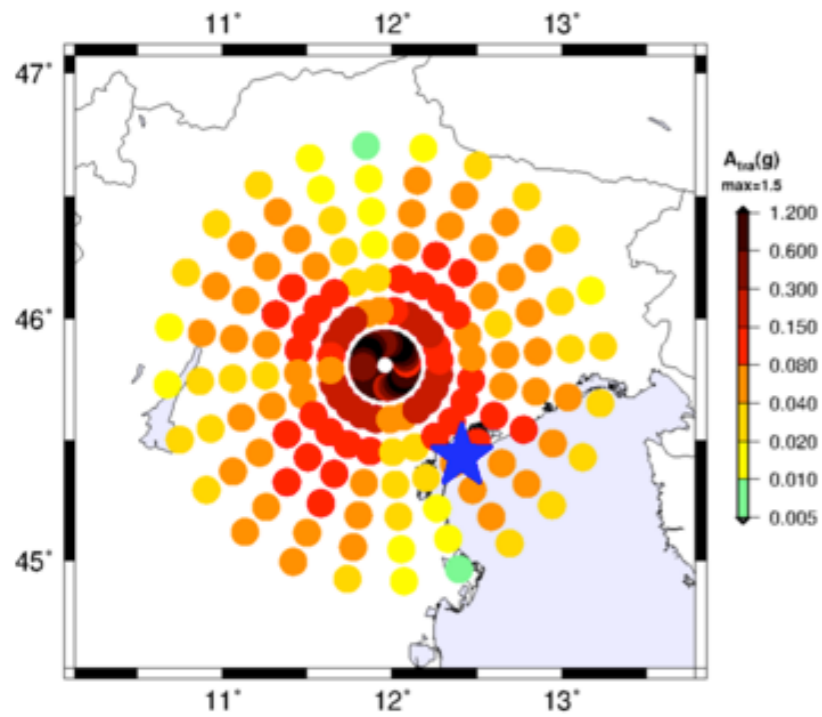


B	Rake (°)	Dip (°)	Strike (°)	D (km)
R	140	70	256	135
T	170	90	294	140

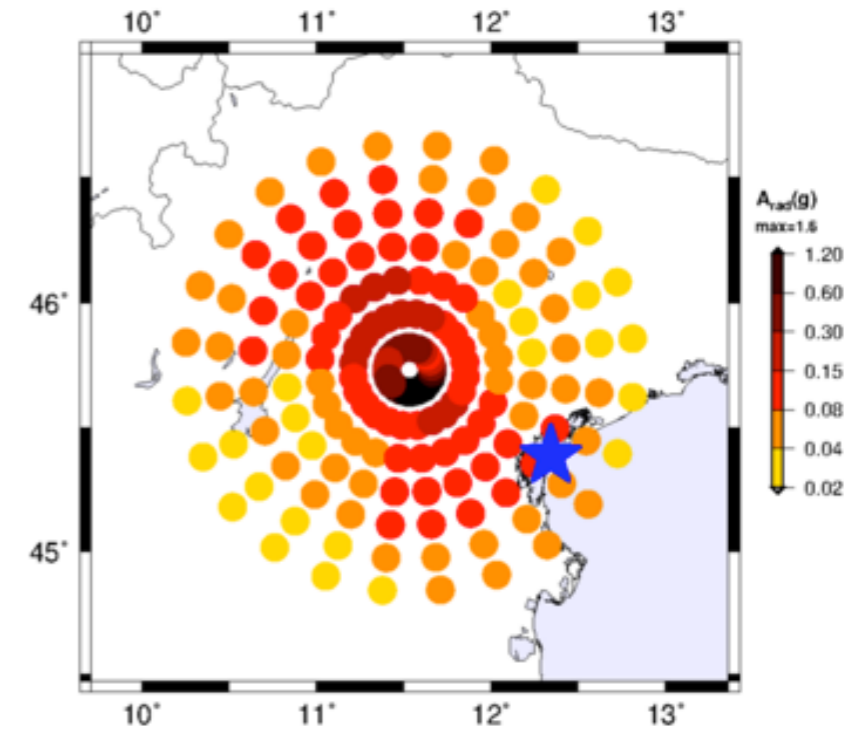




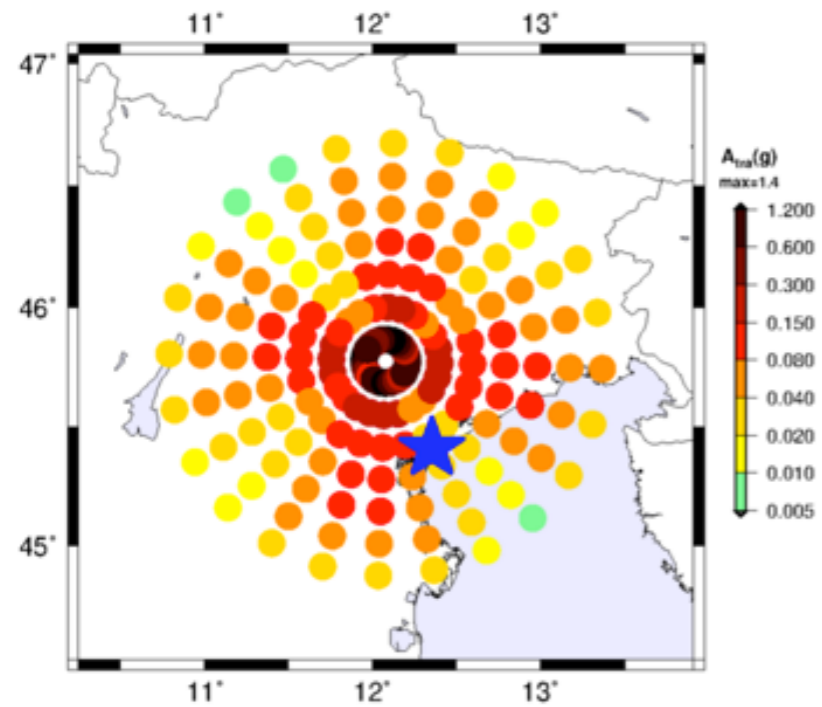
# Local Scale - Scenarios F and G



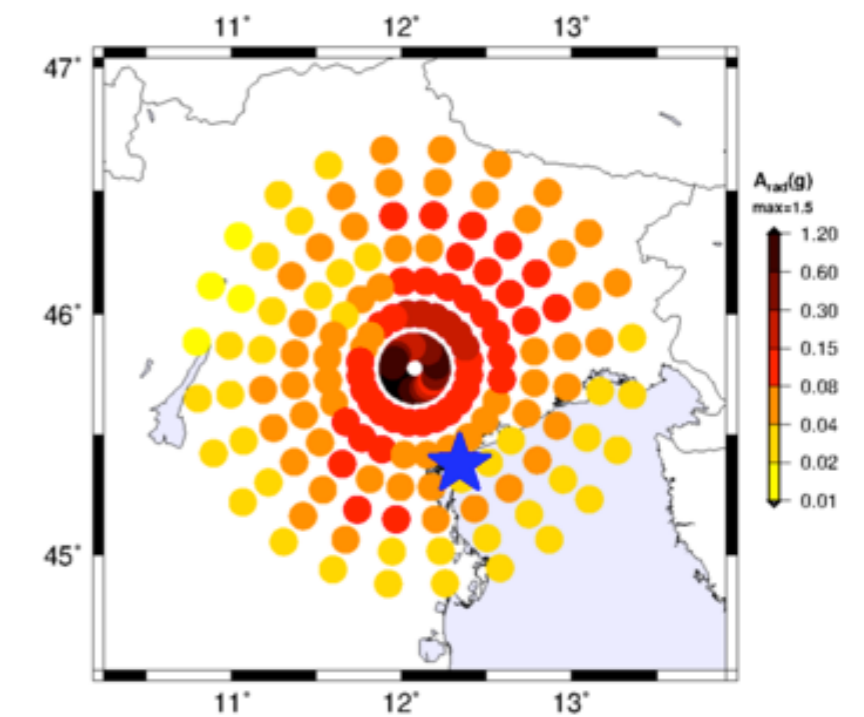
F	Rake (°)	Dip (°)	Strike (°)	D (km)
R	80	30	232	70
T	100	30	265	50



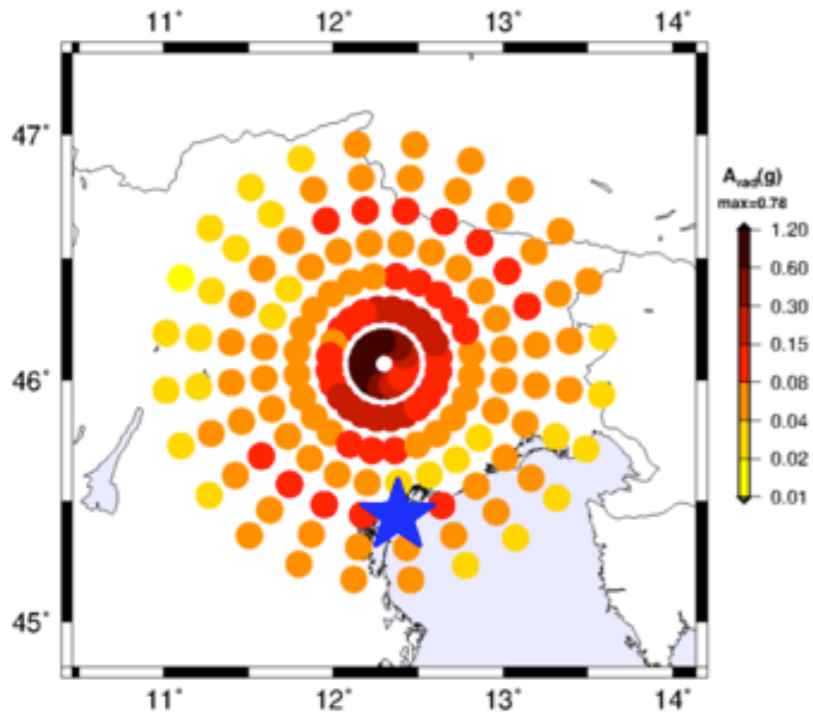
XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>



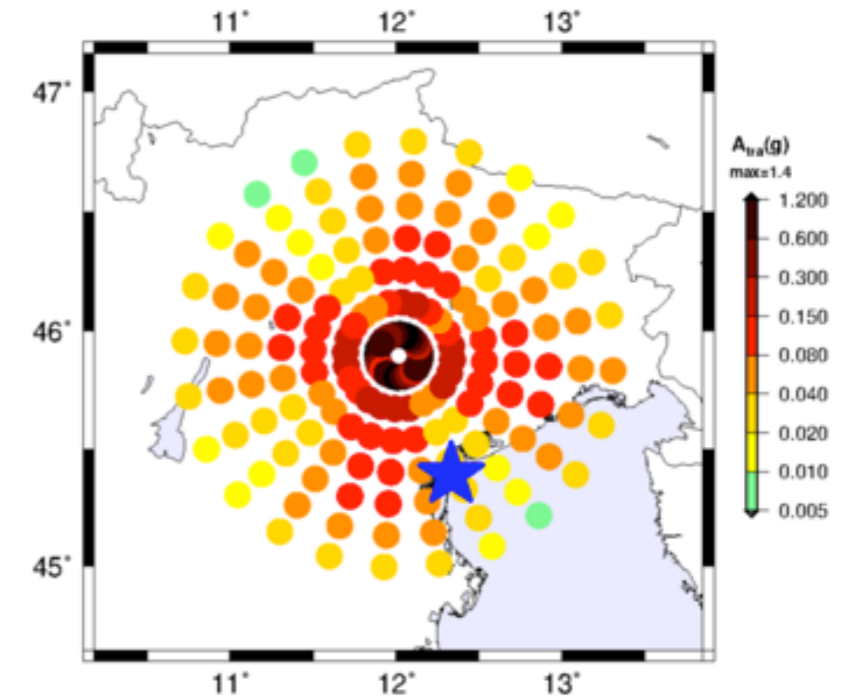
G	Rake (°)	Dip (°)	Strike (°)	D (km)
R	60	30	277	40
T	60	50	302	40



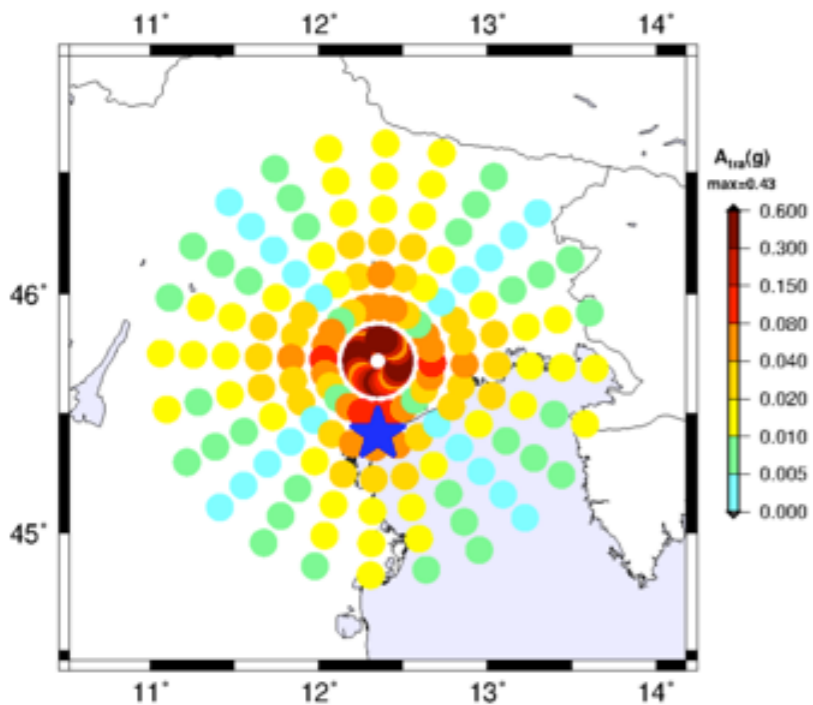
# Local Scale - Scenarios H and N82



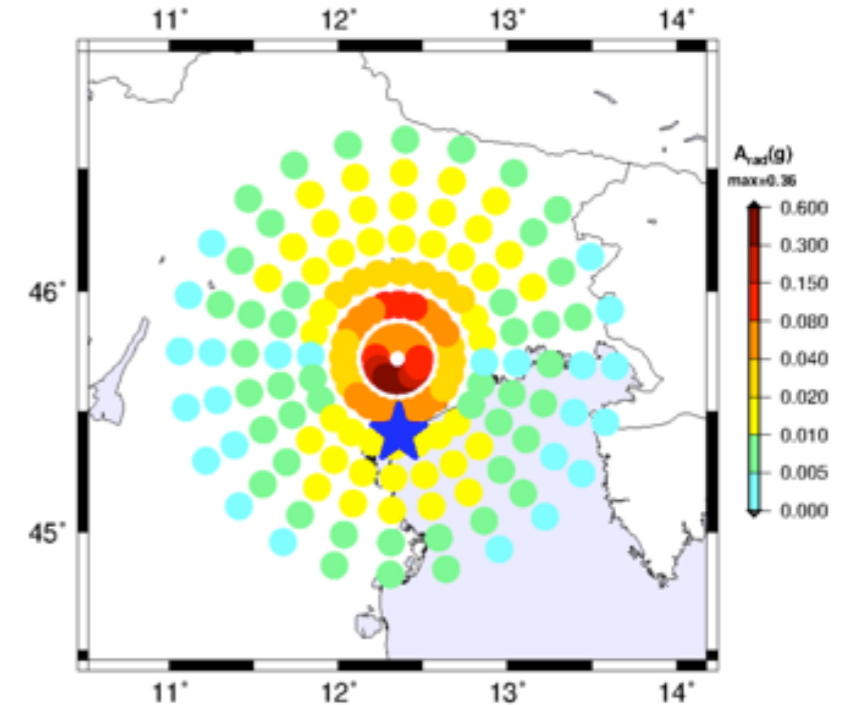
H	Rake (°)	Dip (°)	Strike (°)	D (km)
R	70	45	278	70
T	60	50	304	55



XeRiS Web application  
<http://www.xeris.it/WebApp/index.html>



N	Rake (°)	Dip (°)	Strike (°)	D (km)
R	90	70	92	32
T	15	90	2	32

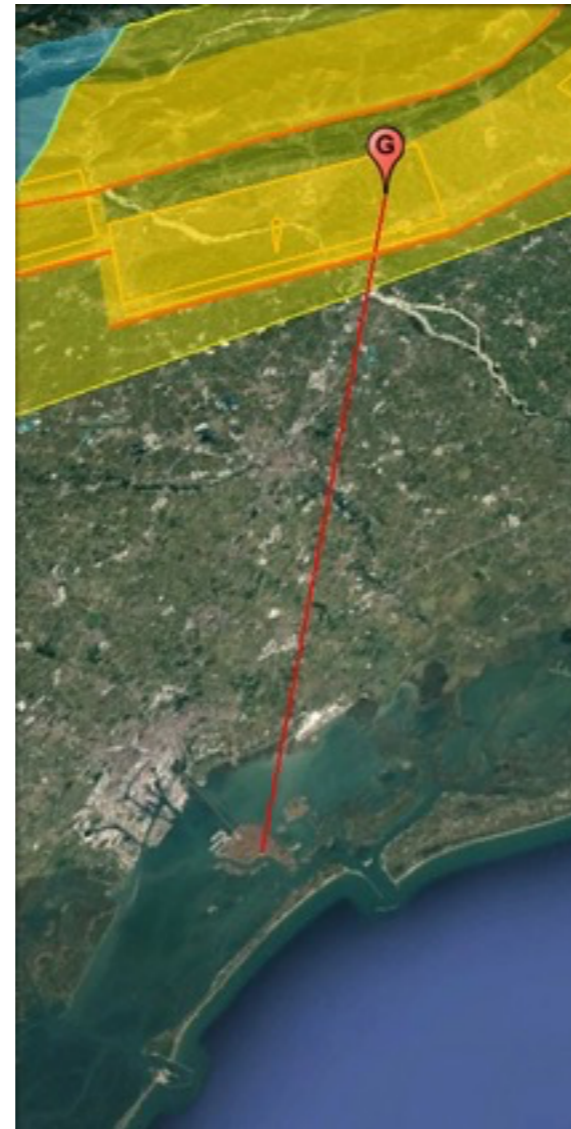


# Local Scale - Scenario G (Venice)

● ZS9

● MSZ

● DISS



## GENERAL INFORMATION

DISS-ID	ITCS060
Name	Montebelluna-Montereale
Compiler(s)	Burrato P.(1)
Contributor(s)	Burrato P.(1), Basili R.(1)
Affiliation(s)	1) Istituto Nazionale di Geofisica e Vulcanologia; Sismologia e Tettonofisica; Via di Vigna Murata, 605, 00143 Roma, Italy
Created	12-May-2011
Updated	21-Jun-2015
Display map ...	
Related sources	<a href="#">ITIS101</a> <a href="#">ITIS124</a> <a href="#">ITIS125</a>

## PARAMETRIC INFORMATION

PARAMETER	QUALITY	EVIDENCE
Min depth [km]	1.0	LD Based on geological data from Galadini et al. (2005).
Max depth [km]	9.0	LD Based on geological data from Galadini et al. (2005).
Strike [deg] min... max	210...245	LD Based on geological data from Galadini et al. (2005).
Dip [deg] min... max	30...50	LD Based on geological data from Galadini et al. (2005).
Rake [deg] min... max	60...100	LD Based on geological and geodetic data.
Slip Rate [mm/y] min... max	0.24...0.91	EJ Inferred from geological data from Galadini et al. (2005).
Max Magnitude [Mw]	6.5	OD Derived from maximum magnitude of associated individual source(s).

LD=LITERATURE DATA; OD=ORIGINAL DATA; ER=EMPIRICAL RELATIONSHIP; AR=ANALYTICAL RELATIONSHIP; EJ=EXPERT JUDGEMENT;

Image Landsat / Copernicus  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth

lat 46.118990° lon 13.223878° elev 151 m eye alt 71.12 km

DISS Working Group (2015). Database of Individual Seismogenic Sources (DISS), Version 3.2.0: A compilation of potential sources for earthquakes larger than M 5.5 in Italy and surrounding areas <http://diss.rm.ingv.it/diss/>

# Local Scale - Scenario G, dip parametric study

<http://www.xeris.it/WebApp/index.html>

Structures

Available Structures

- Ahq
- B11q
- demo1
- demo2
- highQ

Test

Run Identifier

Structures

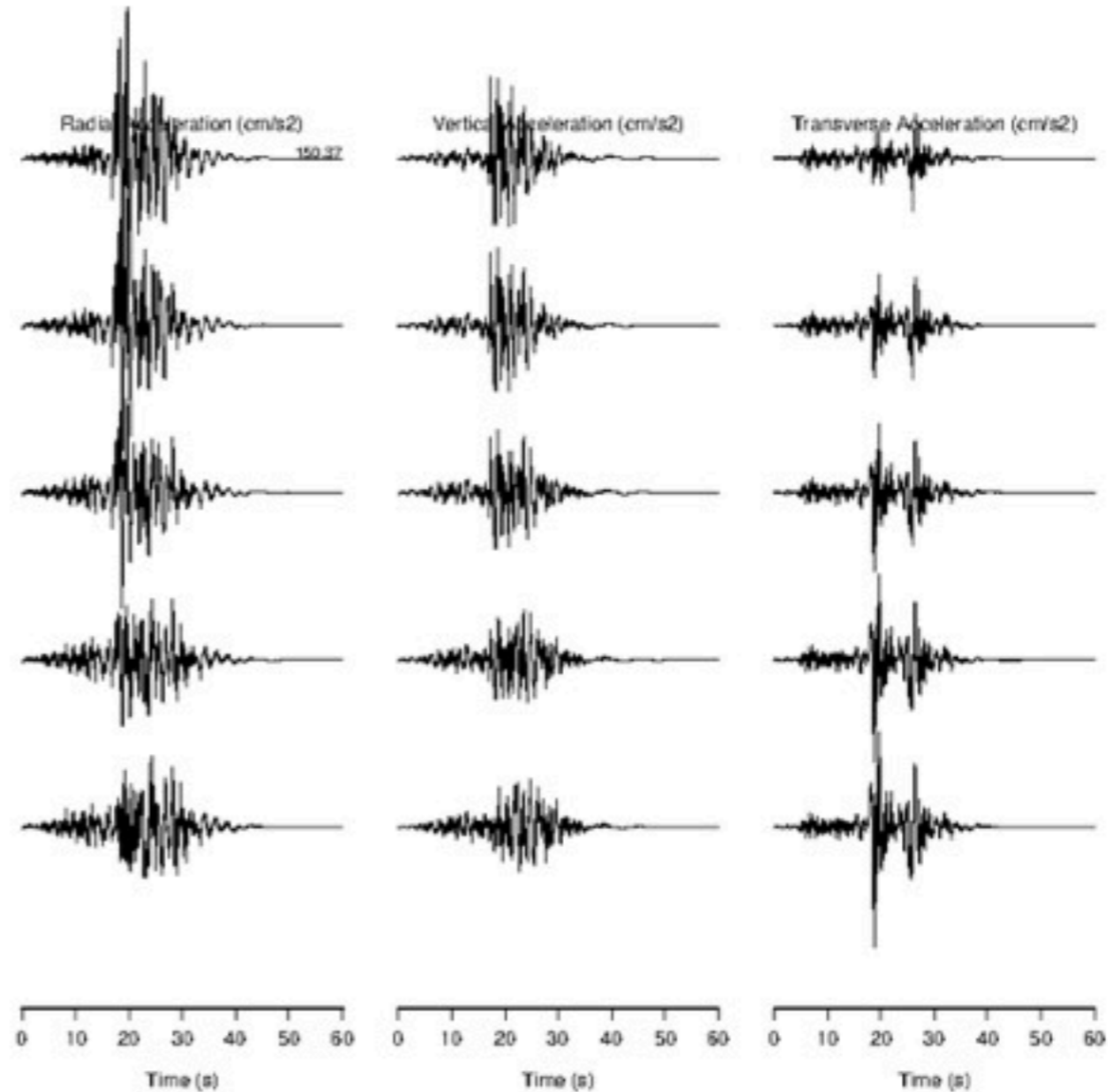
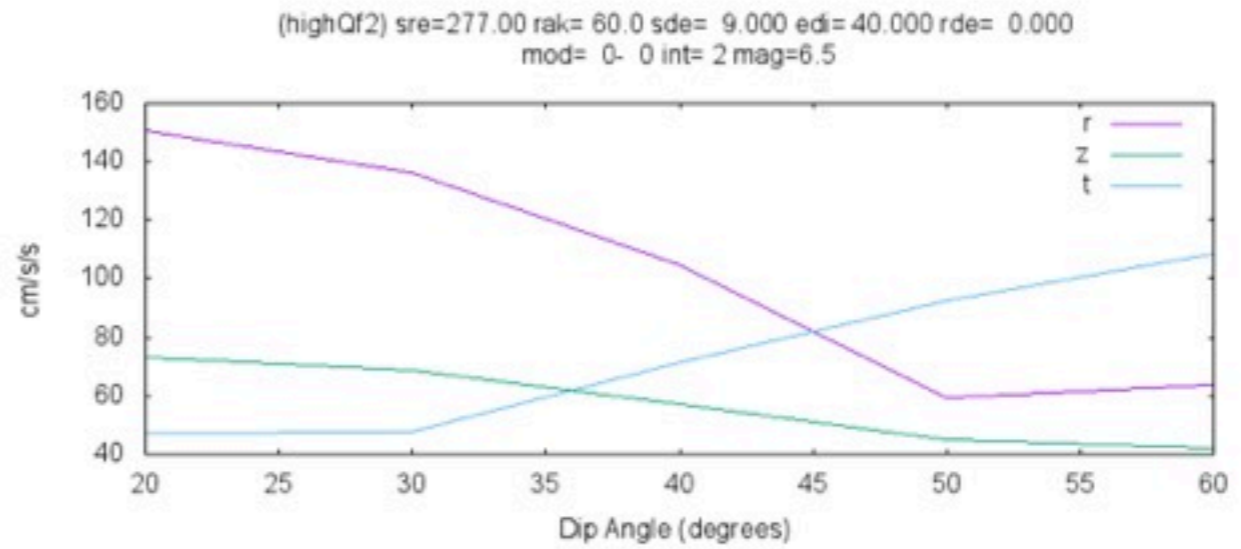
Saved Tests

- D\_1\_10
- GRadial\_rak
- Gradial2
- Gradial
- Gradial\_dep
- Gradial\_dip
- Rieti\_1
- Rieti\_Uni90\_Ahq

Delete

Download

Parameter	Value	Max	Step	Source Model	
Strike/Rec (°)	277	360	15	Scaling:	Size and Trr
Fault Dip (°)	20	60	10	Name:	Gusev1983n
Fault Rake (°)	60	360	15	Rupture:	Unilateral
Depth (km)	9	18	3	Directivity:	0
Magnitude	6.5	7.0	0.1	Realisation:	1
Distance (km)	40	200	10	M range: 4,0 to 8,9 step 0,1	
Interpolation:	2	9	1		
Modes:	0	15	1		
Plot time (s):	60	Acc			



# Local Scale - Scenario G, depth parametric study

<http://www.xeris.it/WebApp/index.html>

Structures

Available Structures

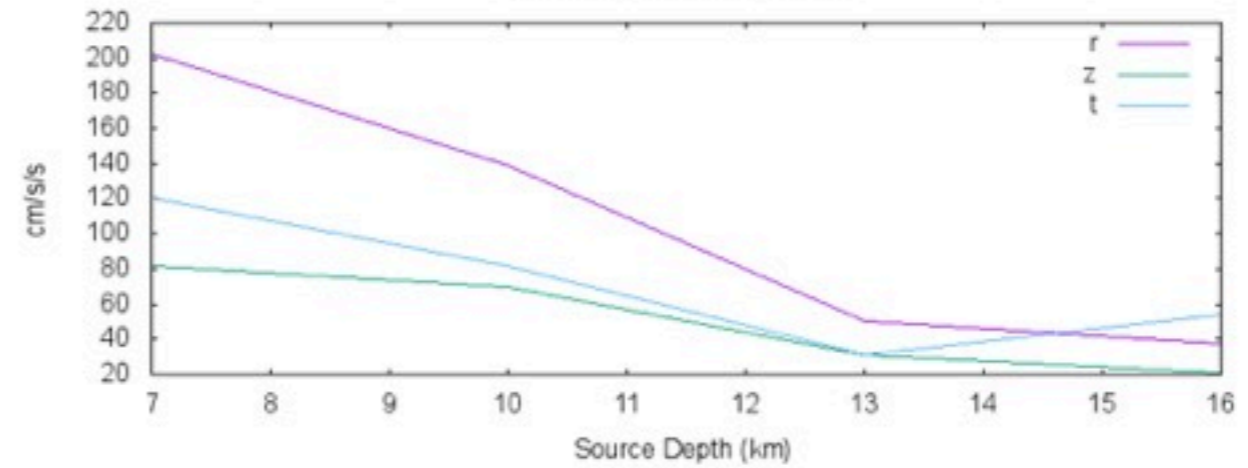
- Ahq
- B11q
- demo1
- demo2
- highQ

Structures

Saved Tests

- D\_1\_10
- GRadial\_rak
- Gradial2
- Gradial
- Gradial\_dep
- Gradial\_dip
- Rieti\_1
- Rieti\_Uni90\_Ahq

(highQ2) sre=277.00 dip=30.0 rak= 60.0 edi= 40.000 rde= 0.000  
mod= 0- 0 int= 2 mag=6.5



Parameter	Value	Max	Step
Strike/Rec (°)	277	360	15
Fault Dip (°)	30	90	5
Fault Rake (°)	60	360	15
Depth (km)	7	18	3
Magnitude	6.5	7.0	0.1
Distance (km)	40	200	10
Interpolation	2	9	1
Modes	0	15	1
Plot time (s)	60	Acc	

Source Model

Scaling:

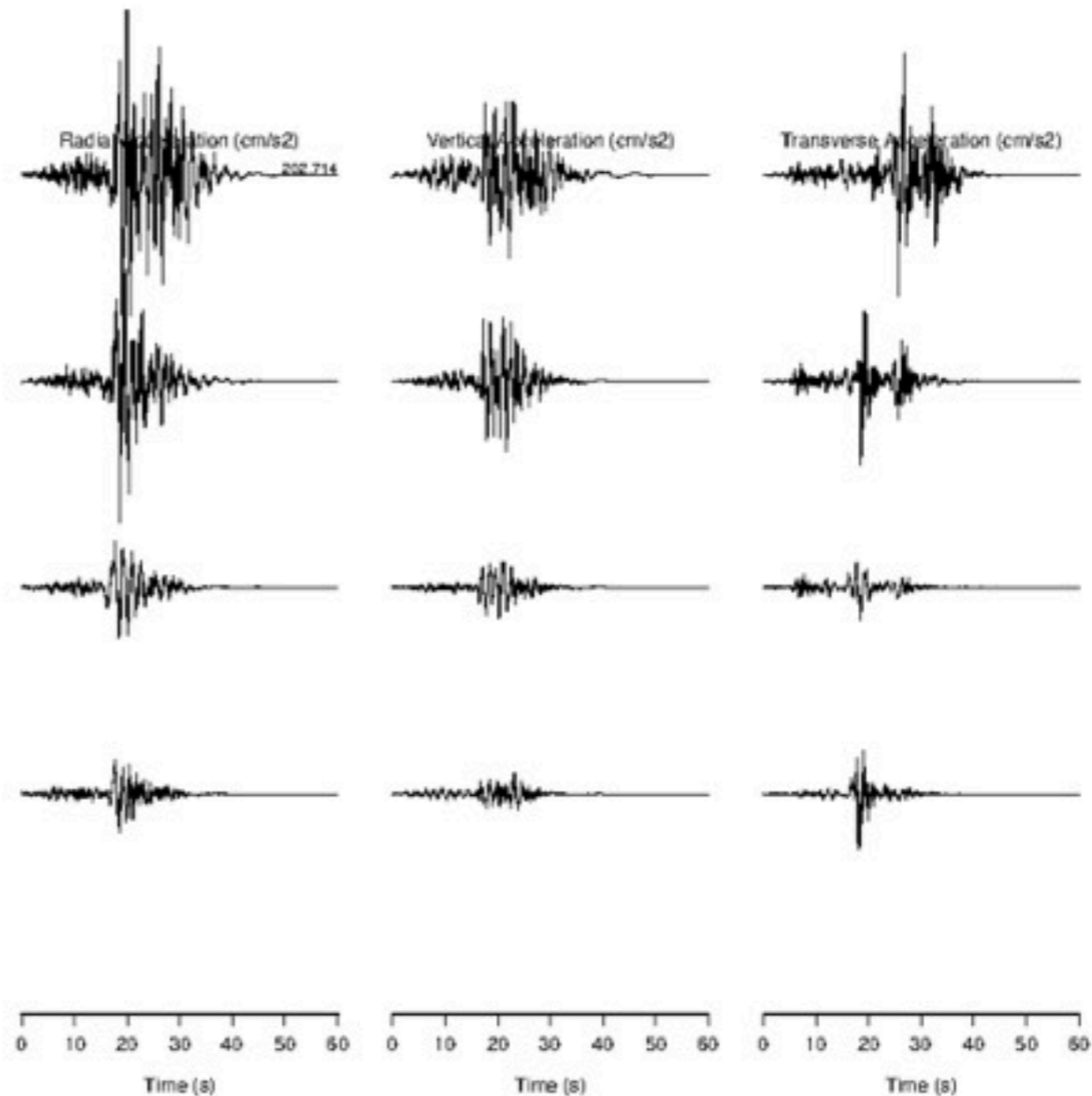
Name:

Rupture:

Directivity:

Realisation:

M range: 4,0 to 8,9 step 0,1



# Local Scale - Scenario G, rake parametric study

<http://www.xeris.it/WebApp/index.html>

Structures

Available Structures

- Ahq
- B11q
- demo1
- demo2
- highQ**

Test

Run Identifier

Saved Tests

- D\_1\_10
- GRadial\_rak**
- Gradial2
- Gradial
- Gradial\_dep
- Gradial\_dip
- Rieti\_1
- Rieti\_Uni90\_Ahq

Delete

Download

Parameter	Value	Max	Step	Source Model
Strike/Rec (°)	277	360	15	Scaling: <input type="text" value="Size and Trr"/>
Fault Dip (°)	30	60	10	Name: <input type="text" value="Gusev1983n"/>
Fault Rake (°)	60	100	15	Rupture: <input type="text" value="Unilateral"/>
Depth (km)	9	18	3	Directivity: <input type="text" value="0"/>
Magnitude	6.5	7.0	0.1	Realisation: <input type="text" value="1"/>
Distance (km)	40	200	10	M range: 4,0 to 8,9 step 0,1
Interpolation	2	9	1	
Modes	0	15	1	
Plot time (s)	60	<input type="text" value="Acc"/>		

