

TASK3

The Irpinia fault system

Secondo Anno:Attività

PHASE		I		II	
SEMESTER		1	2	3	4
Task/RU	WP				
3/6	3.1	Real Time noise data management and processing	Real Time noise data management and processing	Real Time noise data management and processing	
3/6	3.1		Dispersion curve analysis and tomographic inversion	Dispersion curve analysis and tomographic inversion	Dispersion curve analysis and tomographic inversion
3/6	3.2	Real-Time and off-line earthquake data management and processing	Real-Time and off-line earthquake data management and processing	Real-Time and off-line earthquake data management and processing	
3/6	3.2		Refined picking , earthquake locations, tomographic velocity models	Refined picking , earthquake locations, tomographic velocity models	
3/6	3.2			Earthquake Source parameters from inversion of spectral data	Earthquake Source parameters from inversion of spectral data
3/6	3.3	Earthquake data gathering and standard seismic reflection processing	Earthquake data gathering and standard seismic reflection processing	Reflection/converted phase identification and modelling	Reflection/converted phase identification and modelling

PHASE		I		II	
SEMESTER		1	2	3	4
Task/RU	WP				
3/5	3.4	High rate GPS acquisition High-rate GPS processing	High rate GPS acquisition High-rate GPS processing	High-rate GPS procedure for alert systems. Analysis of earthquake detection thresholds	High-rate GPS procedure for alert systems. Analysis of earthquake detection thresholds

Deliverables

ID	Titolo	Task	WP	Stato
D18	Green's function database from ambient seismic noise for the ISNet network (Irpinia test-site)	3	3.1	Completo per la fine del progetto
D19	Resolution analysis for the cross-correlation technique at high frequency	3	3.1	Completo per la fine del progetto
D20	Refined re-picking arrival time catalogue and earthquake locations (Irpinia test-site)	3	3.2	Completo per la fine del progetto. Re-fined re-picking e relocation su subsets
D21	Parametric catalogue of micro-earthquakes including source parameters (Irpinia test-site)	3	3.2	Consegnato I anno, da aggiornare per II anno
D22	Digital 3 D velocity model including interface and event re-location (Irpinia test-site)	3	3.2 3.3	Modello 3D continuo a scala regionale (dati INGV), e locale (ISNet+INGV) in fase di realizzazione. Problemi per il modello con interfacce: identificazione e pickign fasi secondarie
D23	Catalogue of reflected/converted phase arrival times from micro-earthquake data	3	3.3	Da poco è ultimata l'implementazione delle procedure software per riconoscimento di fase, lavoro in corso. Catalogo su subsets di eventi.
D24	Acquisition, storage, analysis and modelling of high-rate GPS data in the Irpinia test site	3	3.4	Completo per la fine del progetto

Open issues

Extraction of Green's function from noise recording	limits at high frequency (>0.5 Hz), use of broad-band stations but at low frequencies (<0.1 Hz) OK \rightarrow increase S/N ratio: borehole stations?, more advanced signal processing technique.
active fault seismicity	decrease the magnitude threshold down to ML 1 or smaller, very accurate location (decametric uncertainty) \rightarrow picking accuracy of msec \rightarrow waveform cross-correlation and semblance/stack analysis
Microearthquake source parameters	need for adequate correction of attenuation and site effects, average estimates from # records > 10 (both accelerometers and velocimeters) reduce errors, near self-similar scaling down to $M_w = 2$, below $M=2$ a clear high frequency cut-off
3D seismic tomography and eqk location	performance of the double difference technique on hand- and cross-correlation picked P-phases, the problem of S-wave identification and picking (and other secondary arrivals)
Amplitude information to locate events and map heterogeneities	dense station coverage, the problem of polarity correction, trade-off eqk location-background velocity and interface position/shape
continuous GPS (1 Hz)	Very positive experiment, in less than 1 day you get mean co-seismic displacement (L'Aquila). Can we be faster? Higher sampling rate in some sites are useful eqk source studies \rightarrow Dense continuous GPS observation around faults