Achievements of UR5 UNI-BAS in project S4

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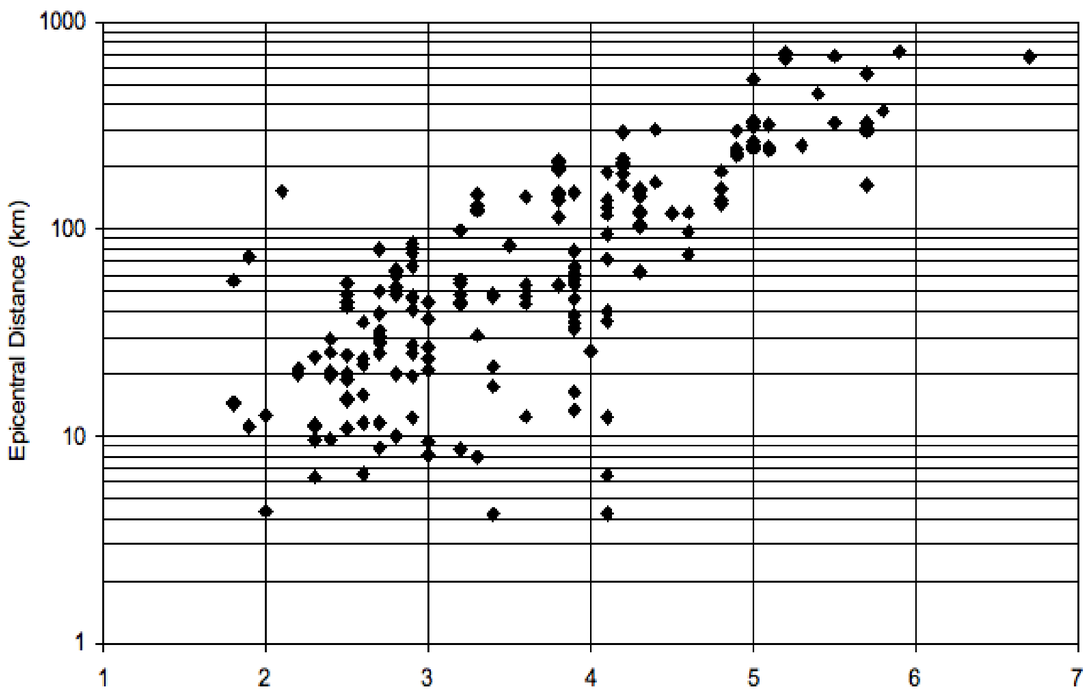
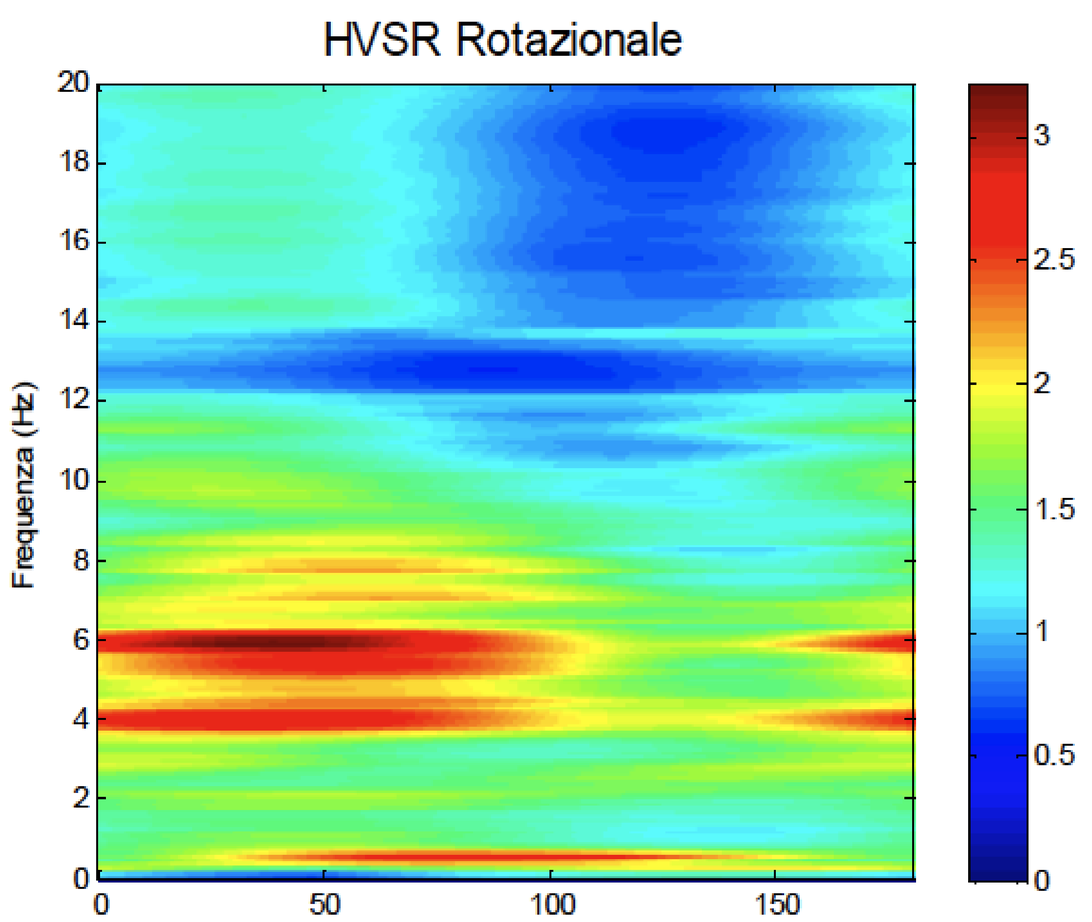
The RU5 was involved in the following tasks:
•1.Update of ITACA data base(Task1)
•2.Surface waves procedures for site investigations (Task 3)
•3.Identification of anomalous recordings (interaction with buildings- Task 4)
•4.Site classification (Task 5)
As for the update of the data base, it was agreed to transfer the data of 20 stations of the DiSGG-IMAA network. For each station the R.U. prepared also the identification sheet with all the available data in the format agreed within the ITACA project.
As for the surface wave procedures, the task of the R.U. was to perform surface wave measurements to be transferred to the R.U. at UniSI. Six measurements were already carried out and one more is under way.
As for the identification of anomalous recordings, the scope of the R.U. at UniBas was to identify the presence of possible building-soil interaction analysing the recordings at the ITACA stations. We analysed 37 station of the RAN. The analysis technique was rather simple. We took the average of the rotational HVSR looking for a specific pattern: the signature of the translational modes of a building should be made of two directional peaks (the first higher) separated by 90° (rotational modes make this pattern more complex). We first analysed the effect for station hosted inside a building. We found that the two-peaks signature is always present within ENEL substations, ranging from 6-8 Hz to 12-18 Hz depending on the building's typology (masonry or pre-cast r.c.). We then considered the interaction with structures located at some distance, starting from dams that are known to affect the recordings as shown for the Italian case of Tolmezzo (Ambiesta Dam) by Barnaba et al. (2007). We observed the structure "footprint" in both the examined cases, the dams at Villetta Barrea and Fiastra (Monte Fiegni station).
After the L'Aquila Earthquake (6th April 2009), we analyzed the main recordings and performed the dynamic characterization of some housings (and the related pillars fixed into the ground on which accelerometer is located). All considered housings are located close to the epicenter: Bussi (BSS code), San Demetrio nè Vestini (SDM), Scafa (SCF) and Cittaducale (CTD). Possible influence of the housing in the high-frequency range is analysed and discussed in a separate poster.
As for the site classification activity, the R.U. interacted with the R.U. at INGV-MI to create a data base of stations (even outside ITACA) having both good quality recordings and down-hole profile reaching at least 30 m. The R.U. re-analysed the data in its possess, providing the data for 47 sites. The statistical analysis of the joint data base are reported in an oral presentation.



Magnitude and distance covered by the data transferred to ITACA

Region	Housing				Number of Records			
	Building (B)	ENEL Box (E_B)	Box	Dam	(B)	(E_B)	Box	Dam
ABRUZZO				VLB				8
BASILICATA	MRV	BRN	STL		7	5	2	
	PTZ	LRG			5	30		
		LRS				14		
CAMPANIA	LVN	ARN	ARI		4	5	5	
		CLT				6		
		MRT				3		
		STR				9		
		TDG				3		
FRIULI	SRCO	BRC	CLA	TLM1	8	4	2	12
		MAI				4		
MARCHE	MNF	CLF	ARQ		6	25	3	
		FHC				4		
		MTL				3		
		PGL				4		
UMBRIA	ASS	BVG	ANNI		76	9	21	
	CLC	CSA			123	9		
	GLT	CSC			8	10		
	NOR	GBP			46	14		
		NCR				46		
		NCR2				136		
		NRC				15		
Number of Stations	9	21	5	2	Total Stations 37			

Stations analysed for the building-soil interference



Rotational HVSR for the station Villetta Barrea near the same arch dam

Research papers prepared during the first year of the project

Bull Earthquake Eng
DOI 10.1007/s10518-009-9129-2

ORIGINAL RESEARCH PAPER

A review of the activity of two accelerometric networks in Basilicata (Italy)

A. Attolico · M. R. Gallipoli · P. Harabaglia · V. Lapenna · M. Mucciarelli · A. B. Rosa

Bulletin of the Seismological Society of America, Vol. 99, No. 1, pp. 340–351, February 2009, doi: 10.1785/0120080083

Comparison of Site Classification from V_{S30}, V_{S10}, and HVSR in Italy

by Maria Rosaria Gallipoli and Marco Mucciarelli

Bull Earthquake Eng
DOI 10.1007/s10518-009-9134-5

ORIGINAL RESEARCH PAPER

Effect of a single vibrating building on free-field ground motion: numerical and experimental evidences

R. Ditommaso · M. Mucciarelli · M. R. Gallipoli · F. C. Ponzo