

**Work And Budget Plan**  
**ES1401 Grant Agreement Period 2**  
 01/09/2015 to 30/04/2016

**Section I: Action Profile**

**Action General Information**

Action Code	ES1401	MC Chair	Dr Andrea Morelli
Action Title	ES1401 - Time Dependent Seismology (TIDES)		
MOU	029/14	Draft MOU	oc-2013-2-16102
CSO Approval Date	2014-05-14		
Action Start Date	2014-11-03	Action End Date	2018-11-02
Science Officer	Dr Deniz Karaca	Administrative Officer	Ms Tania Gonzalez Ovin

**Participating COST Member Countries and Cooperating State:**

	ITC		Non-ITC		Total
Cost Countries having accepted the MOU	Number	10	Number	15	25
	% of all ITCs	40%	% of all non-ITCs	60%	
Number of MC Members	15		25		40

Country and Acceptance Date		
AT 14/10/2014	IE 27/08/2014	SK 19/09/2014
BE 25/11/2015	IT 31/07/2014	ES 22/05/2014
BG 17/07/2014	LU 29/09/2014	SE 09/09/2014
CZ 27/08/2014	MT 14/10/2014	CH 05/09/2014
FI 22/10/2015	NL 02/06/2014	TR 02/03/2015
FR 26/06/2014	NO 10/07/2014	UK 27/05/2014
DE 20/05/2014	PL 01/04/2015	MK 17/09/2015
EL 16/02/2015	PT 03/07/2014	
IS 30/09/2015	RS 27/01/2016	

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### International cooperation

	NNC	IPC	Specific Organisation	Total
Number of entities formally approved to join Action	2	0	0	2
Number of countries	2	0	0	2

### Working Groups

	WG Title	WG Leader	Number of Members
WG1	Workflow integration of data and computing resources	Prof Heiner Igel	10
WG2	Seismic interferometry and ambient noise	Dr Martin Schimmel	10
WG3	Forward problems, High-performance computing applications	Dr Yann CAPDEVILLE	10
WG4	Seismic tomography, full waveform inversion, uncertainties	Prof Karin Sigloch	10
WG5	Applications in the natural environment and industry	Prof Christopher Bean	10

## Section II: MoU objectives and Grant Agreement Period Goals and Activities

### Action Objectives from MoU

Aim/primary Objective	The main objective of the Action is to (1) merge expertise in academia and industry on seismic data processing and modeling for inverse problems; (2) develop the emerging field of time-dependent seismology to monitor complex Earth systems.
Secondary objectives	<ul style="list-style-type: none"> <li>• integration and validation of innovative data mining techniques and numerical methods</li> <li>• development of new design for massive field experiments</li> <li>• evaluation of uncertainties in full-waveform inversion and time-dependent tomography</li> <li>• development of strategies for real-time data assimilation</li> <li>• development of reliable techniques for monitoring active processes (earthquakes, volcanic eruptions, landslides, )</li> <li>• networking of top-level laboratories, coordination among academia and industry in time-dependent seismology</li> <li>• organization of effective exchange programs for early-stage researchers</li> <li>• catalysis of creative initiatives</li> <li>• stimulation of discussion with other data-driven disciplines, climate and ocean science, acoustics, geology, astrophysics</li> </ul>

### Grant Agreement Period

Grant Agreement Period Start Date	01/09/2015	Grant Agreement Period End Date	30/04/2016
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### Grant Agreement Period Goals

Number	Grant Agreement Period Goal	MoU Objective(s) it relates to
GAPG 1	Improve in-depth and critical knowledge of instruments, data, and modeling techniques. Widen awareness of innovative observables and tools.	Aim/Primary objective Secondary objective 1 Secondary objective 8
GAPG 2	Promote short-term scientific missions and exchange among laboratories.	Aim/Primary objective Secondary objective 6 Secondary objective 7
GAPG 3	Monitor current Action activities and plan future ones	Aim/Primary objective

## Section IV: Work and Budget Plan for the Grant Agreement Period

### Work and Budget Plan Summary

A. COST Networking Tools	EUR
(1) Meetings	19,295.26
(2) Training Schools	33,780.00
(3) STSMs	23,700.00
(4) Dissemination	4,500.00
(5) Other Expenses Related to Scientific Activities	206.93
<b>B. Total Science Expenditure (sum of (1) to (5))</b>	<b>81,482.19</b>
<b>C. FSAC (max. of 15% of B)</b>	<b>12,222.33</b>
<b>D. Total Expenditure (B+C)</b>	<b>93,704.52</b>

## Meetings

### Overview

Meeting Title	Meeting Type	Dates	Location	ITC	Total Cost(EUR)
Working Group Meeting: Effect of Topography on Short Period Surface Waves	Working Group Meeting	15/09/2015 - 16/09/2015	Barcelona (Spain)	No	3,875.26
WG2 meeting: Seismic microseism generation - literature study and theory	Working Group Meeting	01/02/2016 - 03/02/2016	Paris (France)	No	6,240.00
Working group 3 meeting: Waves at boundaries	Working Group Meeting	25/04/2016 - 27/04/2016	Nantes (France)	No	9,180.00
				Total	19,295.26

### Details

Meeting Type	Working Group Meeting
Title of the Meeting	Working Group Meeting: Effect of Topography on Short Period Surface Waves
Grant Period Goal(s) it will address	Monitor current Action activities and plan future ones
Description	<p>Ambient noise studies are mostly conducted at high frequencies for local to regional scale studies. At short periods the surface waves can potentially be biased by topography if it is not small compared to the surface wave wavelength and penetration depth. So far, the effect of topography is not well understood and often ignored, for instance, tomographic inversions mostly assume a flat surface. Due to the rising higher resolution of ambient noise studies, there exist now an increasing need and interest to better understand and control also the effect of topography on surface waves of extracted empirical Green functions (EGF). In particular, at the Bertinoro TIDES training school meeting, some researchers expressed their concern on having topography affecting their measurements (e.g., Madeira and Iceland), giving rise to the idea of this group meeting.</p>
Output(s)	<p>During the proposed group meeting it is intended to exchange our experiences/observations and to think on how to start to analyze the bias by topography. That is, the main discussion will be on (1) how to evaluate the influence of topography on group- and phase- velocity dispersion measurements and (2) how to organize/kick-off studies on this bias. During a 2nd day we will discuss about bathymetry and the possibility of scattering at islands. Although, there exist a small core group of researchers with observations, this meeting is open to anybody who is interested to participate/contribute/study actively the bias of topography. Thus, the meeting is for anybody who already works on this topic, who wants to study this topic, and/or who can contribute through experiences or with working tools.</p>

Location	Barcelona (Spain)	ITC	No
Start Date	2015-09-15 08:00:00	End Date	2015-09-16 17:00:00
Duration	2 days		
Number of expected total participants	10	Number of participants to be reimbursed from COST funds	6
Average reimbursement(per participant)(EUR)	599.21	Total Reimbursement costs (EUR)	3,595.26
Local Organiser Support (EUR)	280.00		
Total cost of the meeting (EUR)	3,875.26		

Meeting Type	Working Group Meeting		
Title of the Meeting	WG2 meeting: Seismic microseism generation - literature study and theory		
Grant Period Goal(s) it will address	Improve in-depth and critical knowledge of instruments, data, and modeling techniques. Widen awareness of innovative observables and tools.,Promote short-term scientific missions and exchange among laboratories.		
Description	Meeting of Working Group 2 on Seismic microseism generation - literature study and theory		
Output(s)	The goal of the meeting is to introduce PhD students who will or are directly studying ambient noise generation mechanisms to the underlying theory proposed in the literature. Moreover, the interaction of several groups who work on similar topics would lead to common projects in the future.		
Location	Paris (France)	ITC	No
Start Date	2016-02-01 09:00:00	End Date	2016-02-03 17:00:00
Duration	3 days		
Number of expected total participants	10	Number of participants to be reimbursed from COST funds	6
Average reimbursement(per participant)(EUR)	940.00	Total Reimbursement costs (EUR)	5,640.00
Local Organiser Support (EUR)	600.00		
Total cost of the meeting (EUR)	6,240.00		

Meeting Type	Working Group Meeting		
Title of the Meeting	Working group 3 meeting: Waves at boundaries		
Grant Period Goal(s) it will address	Improve in-depth and critical knowledge of instruments, data, and modeling techniques. Widen awareness of innovative observables and tools.,Promote short-term scientific missions and exchange among laboratories.		

Description	Working Group 3 meeting: modelling waves at material boundaries. The objective of this small workshop is to gather a small number of "specialists/developers" with a small number of "practical users" for discussion. Because the subject is very broad for a 2-3 days short meeting, we will try to focus on waves at boundaries: External & internal topography, solid-fluid boundaries. Some applications could be (but are not limited to), ocean-crust coupling (Noise modelling with bathymetry ...), landslides -seismic coupling, Moho undulations, geotechnical layers, ellipticity/axisymmetry ...		
Output(s)	Guidelines for better numerical modelling in presence of solid/fluid boundaries.		
Location	Nantes (France)	ITC	No
Start Date	2016-04-25 09:00:00	End Date	2016-04-27 17:00:00
Duration	3 days		
Number of expected total participants	12	Number of participants to be reimbursed from COST funds	9
Average reimbursement(per participant)(EUR)	940.00	Total Reimbursement costs (EUR)	8,460.00
Local Organiser Support (EUR)	720.00		
Total cost of the meeting (EUR)	9,180.00		



## Training School

### Overview

Title of the Training School	Dates	Location	ITC	Total Cost(EUR)
Training course on ambient noise analysis tools	15/04/2016 - 17/04/2016	Vienna (Austria)	No	33,780.00
			Total	33,780.00

### Details

Title of the Training School	Training course on ambient noise analysis tools		
Grant Period Goal(s) it will address	Improve in-depth and critical knowledge of instruments, data, and modeling techniques. Widen awareness of innovative observables and tools.,Promote short-term scientific missions and exchange among laboratories.		
Description	Tools for analysis of ambient seismic noise. Trainers: Florent Brenguier (ISTerre - Grenoble), Thomas Lecocq (Royal Observatory of Belgium - Brussels)		
Output(s)	Training on use of software tools for seismological analysis and modelling of ambient noise		
Location	Vienna (Austria)	ITC	No
Start Date	2016-04-15 12:00:00	End Date	2016-04-17 14:00:00
Number of trainers	2	Number of trainees	39
Number of trainers to be reimbursed	2	Number of trainees to be reimbursed	39
Average trainer Reimbursement(EUR)	940.00	Average reimbursement per trainee(EUR)	780.00
Total trainer Reimbursement(EUR)	1,880.00	Total trainee Grant(EUR)	30,420.00
Local Organiser Support (EUR)	1,480.00		
Total cost of the Training School(EUR)	33,780.00		

### STSM

Number	12
Average cost per STSM(EUR)	1,975.00
Total cost(EUR)	23,700.00

How will the STSMs contribute to the achievement of the Grant Period Goals?

### Disseminations

Title	Type	Publisher/provider	Expected date of Release	Cost(EUR)
Action Website	Action Website	TBD	31/12/2015	4,500.00

How will this Dissemination contribute to the achievement of the Grant Period Goals?	
Improve in-depth and critical knowledge of instruments, data, and modeling techniques. Widen awareness of innovative observables and tools.	
Total Disseminations	4,500.00

### OERSA

Item	Cost(EUR)
Bank charges	206.93