

Work And Budget Plan

ES1401 Grant Agreement Period 5

01/05/2018 to 02/11/2018

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 Members:

	ITC		Non-ITC		Total
COST Members (countries) having accepted the MoU	Number	12	Number	15	27
	% of ITC in Action	44.44%	% of non-ITC in Action	55.56%	
	% of all ITC	60%	% of all non-ITC	88.24%	
Number of Action MC members	19		24		43

COST Member and Acceptance Date		
AT 14/10/2014	HU 28/03/2017	PT 03/07/2014
BE 25/11/2015	IS 30/09/2015	RS 27/01/2016
BA 14/11/2017	IE 27/08/2014	SK 19/09/2014
BG 17/07/2014	IT 31/07/2014	ES 22/05/2014
CZ 27/08/2014	LU 29/09/2014	SE 09/09/2014
FI 22/10/2015	MT 14/10/2014	CH 05/09/2014
FR 26/06/2014	NL 02/06/2014	TR 02/03/2015
DE 20/05/2014	NO 10/07/2014	UK 27/05/2014
EL 16/02/2015	PL 01/04/2015	MK 17/09/2015

Submitted : 2018-04-05 at 11:31 AM

Generated : 2018-04-17 at 11:58 AM

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 WG 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
<ol style="list-style-type: none"> 1. integration and validation of innovative data mining techniques and numerical methods 2. development of new design for massive field experiments 3. evaluation of uncertainties in full-waveform inversion and time-dependent tomography 4. development of strategies for real-time data assimilation 5. development of reliable techniques for monitoring active processes (earthquakes, volcanic eruptions, landslides,) 6. networking of top-level laboratories, coordination among academia and industry in time-dependent seismology 7. organization of effective exchange programs for early-stage researchers 8. catalysis of creative initiatives 9. stimulation of discussion with other data-driven disciplines, climate and ocean science, acoustics, geology, astrophysics

Grant Agreement Period

Grant Agreement Period Start Date	01/05/2018	Grant Agreement Period End Date	02/11/2018
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Grant Agreement Period Goals

Number	Grant Agreement Period Goal	MoU Objective(s) it relates to
GAPG 1	Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities.	<ul style="list-style-type: none"> • Aim/Primary objective • Secondary objective 2 • Secondary objective 4 • Secondary objective 5 • Secondary objective 6 • Secondary objective 7
GAPG 2	New data are being collected, that provide exciting new prospects for high-detail monitoring of time variations in the Earth. These new data include ocean-bottom seismometers, rotational seismometers, distributed acoustic sampling, high-density 'nodal' networks. A goal of the fourth year of TIDES is to encourage consideration of such new data, recommend better understanding, and support their use.	<ul style="list-style-type: none"> • Aim/Primary objective • Secondary objective 2 • Secondary objective 5 • Secondary objective 8 • Secondary objective 9
GAPG 3	This is the last Grant Period, after which the Action will terminate. We will devote the last few months to make ourselves sure that TIDES will leave an active legacy. This GP Goal looks at the future. We will critically consider past achievements and difficulties, in order to plan future steps. Given the satisfaction of participants, we will examine how to keep the momentum that was reached by the Action, considering prospects for future funding of networking and research.	<ul style="list-style-type: none"> • Aim/Primary objective • Secondary objective 6 • Secondary objective 8
GAPG 4	Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.	<ul style="list-style-type: none"> • Aim/Primary objective • Secondary objective 6 • Secondary objective 9

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

Work and Budget Plan Summary

A. COST Networking Tools	EUR
(1) Meetings	25,406.00
(2) Training Schools	25,717.00
(3) Short Term Scientific Missions (STSM)	4,500.00
(4) ITC Conference Grant	6,200.00
(5) COST Action Dissemination	1,500.00
(6) Other Expenses Related to Scientific Activities (OERSA)	170.00
B. Total Science Expenditure (sum of (1) to (6))	63,493.00
C. Financial and Scientific Administration and Coordination (FSAC) (max. of 15% of B)	9,523.95
Total Grant (B+C)	73,016.95

Meetings

Overview

Meeting Title	Meeting Type	Dates	Location	ITC	Total Cost(EUR)
Workshop on monitoring time-dependent natural and anthropic environments	Workshops/Conferences	02/07/2018 - 06/07/2018	Prague (Czech Republic)	Yes	5,550.00
Meeting of the Management Committee	Management Committee Meeting, Core Group Meeting	04/07/2018 - 04/07/2018	Prague (Czech Republic)	Yes	15,996.00
Meeting of WG1-WG2-WG5	Working Group Meeting	19/09/2018 - 21/09/2018	Galway (Ireland)	No	3,860.00
				Total	25,406.00

Details

Meeting Type	Workshops/Conferences		
Title of the Meeting	Workshop on monitoring time-dependent natural and anthropic environments		
Grant Period Goal(s) it will address	<p>Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities.,New data are being collected, that provide exciting new prospects for high-detail monitoring of time variations in the Earth. These new data include ocean-bottom seismometers, rotational seismometers, distributed acoustic sampling, high-density 'nodal' networks. A goal of the fourth year of TIDES is to encourage consideration of such new data, recommend better understanding, and support their use.,This is the last Grant Period, after which the Action will terminate. We will devote the last few months to make ourselves sure that TIDES will leave an active legacy. This GP Goal looks at the future. We will critically consider past achievements and difficulties, in order to plan future steps. Given the satisfaction of participants, we will examine how to keep the momentum that was reached by the Action, considering prospects for future funding of networking and research.,Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.</p>		
Description	Final workshop for all WG's to evaluate application to real-world cases of methods and techniques to detect changes in earth structure at all scales.		
Output(s)	Assessment of prospects for improving monitoring of time-changing earth properties in natural and anthropic environments. Assessment of Action achievements. Measures to ensure lasting legacy. New initiatives aimed at continuing the work done by TIDES, to maintain the networking that was built during the past four years.		
Location	Prague (Czech Republic)	ITC	Yes
Start Date	2018-07-02 09:00:00	End Date	2018-07-06 12:00:00
Duration	5 days		

Number of expected total participants	20	Number of participants to be reimbursed from COST funds	10
Average reimbursement(per participant)(EUR)	555.00	Total Reimbursement costs (EUR)	5,550.00
Local Organiser Support (EUR)	0.00		
Total cost of the meeting (EUR)	5,550.00		

Meeting Type	Management Committee Meeting,Core Group Meeting		
Title of the Meeting	Meeting of the Management Committee		
Grant Period Goal(s) it will address	This is the last Grant Period, after which the Action will terminate. We will devote the last few months to make ourselves sure that TIDES will leave an active legacy. This GP Goal looks at the future. We will critically consider past achievements and difficulties, in order to plan future steps. Given the satisfaction of participants, we will examine how to keep the momentum that was reached by the Action, considering prospects for future funding of networking and research.,Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.		
Description	This Management Committee meeting will address topics relevant to this Grant Period, such as: monitoring of the activities of the Action, review of reports from the WG leaders, and all other relevant business. The MC meeting will be preceded by a meeting of the Core Group, that will preliminary prepare the discussion of the MC meeting. The Action is getting to its end, so the MC will address policies to maintain the momentum gained during these four years, towards new initiatives.		
Output(s)	Plans for the final months of the Action. Plans to maximise final impact of the Action. Plans for subsequent initiatives.		
Location	Prague (Czech Republic)	ITC	Yes
Start Date	2018-07-04 10:00:00	End Date	2018-07-04 19:00:00
Duration	1 day		
Number of expected total participants	43	Number of participants to be reimbursed from COST funds	43
Average reimbursement(per participant)(EUR)	372.00	Total Reimbursement costs (EUR)	15,996.00
Local Organiser Support (EUR)	0.00		
Total cost of the meeting (EUR)	15,996.00		

Meeting Type	Working Group Meeting
Title of the Meeting	Meeting of WG1-WG2-WG5
Grant Period Goal(s) it will address	Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to

	image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities.,New data are being collected, that provide exciting new prospects for high-detail monitoring of time variations in the Earth. These new data include ocean-bottom seismometers, rotational seismometers, distributed acoustic sampling, high-density 'nodal' networks. A goal of the fourth year of TIDES is to encourage consideration of such new data, recommend better understanding, and support their use.		
Description	The meeting intends to discuss recent developments in observing and understanding ocean generated seismic noise. This includes OBS deployments and instrument developments using 6 DoF sensing, array-analysis of Love and Rayleigh waves, polarization analysis, multiple source identification and experimental design.		
Output(s)	Improved knowledge on instrumentation and on the physics of seismic noise generation at ocean bottom.		
Location	Galway (Ireland)	ITC	No
Start Date	2018-09-19 09:00:00	End Date	2018-09-21 17:00:00
Duration	3 days		
Number of expected total participants	8	Number of participants to be reimbursed from COST funds	4
Average reimbursement(per participant)(EUR)	940.00	Total Reimbursement costs (EUR)	3,760.00
Local Organiser Support (EUR)	100.00		
Total cost of the meeting (EUR)	3,860.00		

Training Schools

Overview

Title of the Training School	Dates	Location	ITC	Total Cost(EUR)
Training School	02/07/2018 - 06/07/2018	Prague (Czech Republic)	Yes	25,717.00
			Total	25,717.00

Details

Title of the Training School	Training School		
Grant Period Goal(s) it will address	Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities.,New data are being collected, that provide exciting new prospects for high-detail monitoring of time variations in the Earth. These new data include ocean-bottom seismometers, rotational seismometers, distributed acoustic sampling, high-density 'nodal' networks. A goal of the fourth year of TIDES is to encourage consideration of such new data, recommend better understanding, and support their use.		
Description	The school will be devoted to applications to earthquakes, volcanoes, glaciers, landslides, reservoirs, cities.....		
Output(s)	Trainees will learn about ...		
Location	Prague (Czech Republic)	ITC	Yes
Start Date	2018-07-02 09:00:00	End Date	2018-07-06 13:00:00
Number of trainers	15	Number of trainees	50
Number of trainers to be reimbursed	12	Number of trainees to be reimbursed	29
Average trainer Reimbursement(EUR)	631.00	Average reimbursement per trainee(EUR)	605.00
Total trainer Reimbursement(EUR)	7,572.00	Total trainee Grant(EUR)	17,545.00
Local Organiser Support (EUR)	600.00		
Total cost of the Training School(EUR)	25,717.00		

Short Term Scientific Missions (STSM)

Number	Average cost per STSM(EUR)	Total cost(EUR)
3	1,500.00	4,500.00
Grant Period Goal(s) it will address	Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities., Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.	
Description	STSM support exchange of young scientists among institutions in participating countries	
Output(s)	Increased diffusion of expertise and improvement of networking among laboratories	

ITC Conference Grant

Number	Average cost per Grant(EUR)	Total cost(EUR)
4	1,550.00	6,200.00
Grant Period Goal(s) it will address	Following the planned time development of the MoU, the fourth year of the Action will capitalise on methodological aspects, extensively dealt in the previous periods, to finally delve into applications of seismological techniques to image and monitor time variations in a variety of environments, both natural and anthropic. This will include earthquake preparation zones, volcanoes, glaciers, landslides, oil/gas reservoirs, dams, cities.,Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.	
Description	ITC Conference Grants are an excellent opportunity to support participation of young scientists to conferences	
Output(s)	Increased scientific interactions for early-stage scientists, improved diffusion of research results. Dissemination of Action results.	

COST Action Dissemination

Title	Type	Publisher/provider	Expected date of Release	Cost(EUR)
Legacy action website	Action Website	In-house, managed by the Grant Holder (INGV)	02/11/2018	1,500.00
Grant Period Goal(s) it will address	Dissemination of Action accomplishments, through publication on scientific literature, press releases, internet and social media, presence at conferences with specially-organised sessions.			
Description	The Action website will be maintained through the fourth year, and actions will be taken to ensure persistence of the web site as a legacy of the Action			
Output(s)	Updated web site and final form to be kept as legacy			

Total Disseminations	1,500.00
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Other Expenses Related to Scientific Activities (OERSA)

Item	Cost(EUR)
Bank charges	170.00