JERICO

Application for Transnational Access

to Coastal Observatories

National Research Council of Italy
OGS
cnrs
IBW PAN
hcmr
NIVA
Norwegian Institute for Water Research
Ifremer
Helmholtz-Zentrum Geesthacht
Zentrum für Material- und Küstenforschung
CSIC
National Oceanography Centre

Description of the project (to be provided in pdf format)
Please contact the manager of the infrastructure/installation you wish to use before writing the proposal

PART 1: User group details

Indicate if the proposal is submitted by

O an individual
X a user group

Information about the applicants (PI and project partners)

Principal Investigator (user group leader)

Title _Mr__ Name and Surname George Petihakis

Gender **X** Male O Female

Institution _____HCMR_____

Department / Research Group ___Institute of Oceanography_____

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Fax +302810337822 _____

Project partners
(repeat for each partner of the group)

Partner # 1

Title _Mr__ Name and Surname Athanasios Chondronasios

Gender **X** Male O Female

Institution _____HCMR_____

Department / Research Group ___Institute of Oceanography_____

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Country Greece _____

email chondronasios@ath.hcmr.gr

Partner # 2

Title _Mr__ Name and Surname Manolis Ntoumas

Gender **X** Male O Female

Institution _____HCMR_____

Department / Research Group ___Institute of Oceanography_____

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Country Greece _____

email mntou@hcmr.gr _____

PART 2: Additional information about the applicant(s) expertise

Expertise of the group in the domain of the application

The HCMR team applying for the TNA is actively involved in:

- *Validation and calibration of oceanographic instrumentation.*
- *Field deployment of marine observing systems.*
- *Marine data quality assurance and process.*

Short CV of the PI

George Petihakis, *has a Ph.D in Marine Ecosystem Modelling (2004), an M.Sc in Applied Fish Biology (1990) and a B.Sc in Ecology (1989). He is an elected associate researcher of HCMR/Institute of Oceanography with 16 years of experience in marine science with particular emphasis on marine ecological modelling, operational monitoring, and data analysis. He has contributed to the development of the POSEIDON-M3A marine observing station in East Mediterranean and he is responsible for its operation and maintenance. As ecosystem modeller he has extensively used collected and processed data for the tuning and validation of ecosystem models for Cretan and Aegean Seas, East Mediterranean and Mediterranean Basins. Furthermore he has developed a decision making management tool for aquacultures which provides valuable information on key parameters such as the location and size of the farm through a holistic environmental impact approach. He has been involved as coordinator, principal investigator or researcher, in 31 EU and national programs some of which are RECITE, EUROFORM, MATER-MAST II, THETIS, MFSPP, COST-IMPACT, MFSTEP, MEDEX, MedEcos, INSEA, INTERREG III-A, POSEIDON I&II, EuroSITES, MEECE. He has 28 published papers in peer reviewed journals, 14*

publications in books and scientific series, 64 publications in conference proceedings. During the period 2003 – 2008 he was Associate lecturer at the Technological Educational Institute of Crete (TEI), School of food technology and dietetics, Department of human nutrition and dietetics. He has been evaluator of research projects in National (GRST) and European (FP7) programs, referee in 9 scientific journals in the area of physical chemical and biological oceanography and an active member in 5 scientific organizations.

A list of 5 recent, relevant publications of the participant(s) in the field of the project

*Pollani A., Triantafyllou G., **Petihakis G**., Nittis K, Dounas C. and C. Koutitas, 2001: The POSEIDON operational tool for the prediction of floating pollutant transport. Marine Pollution Bulletin, Vol.43(7-12), pp 270-278.*

*Nittis K., Tziavos C., Thanos I., Drakopoulos P., Cardin, V., Gacic M., **Petihakis G**. and R. Basana, 2003. The Mediterranean Moored Multi-sensor Array (M3A): System Development and Initial Results. Annales Geophysicae, Vol.21, pp 75-87.*

*Triantafyllou G., **Petihakis G**. and J.I Allen, 2003: Assessing the performance of the Cretan Sea ecosystem model with the use of high frequency M3A buoy data set. Annales Geophysicae, Vol.21, pp 365-375.*

***Petihakis G.**, Drakopoulos, P., Nittis, C., Zervakis, V., Christodoulou, C. and C. Tziavos, 2006: M3A system (2000 – 2005) – operation and maintenance. Ocean Science, 3, 117–128.*

*Nittis K., Tziavos C., Bozzano R., Cardin V., Thanos Y., **Petihakis G.**, Schiano M.E., and F. Zanon, 2007: The M3A multi-sensor buoy network of the Mediterranean Sea. Ocean Science, 3, 229-243.*

PART 3: Detailed scientific description of the project

List the main objectives of the proposed research

1. *Study the procedures and technics used for the calibration of temperature oceanographic sensors using PRTs, Triple Point of Water cells and Melting Point of Gallium.*

2. *Get familiar with the use of scientific precision equipment.*

3. *Calibrate the HCMR standard temperature sensor.*

Give a brief description of the scientific background and rationale of your project

The calibration of oceanographic sensors is a very sensitive and important process often associated with heavy costs for the operators (shipping sensors to the manufacturer). In the past several oceanographic centers in EU have invested significant resources towards the development of individual calibration labs with the ability to handle a number of parameters and sensor types. However the different needs and demands have contributed in a quite large diversification and specialisation.

During the last decade, many organizations worldwide have developed services in the field of Operational Oceanography in the framework of national and international projects. Following this trend, HCMR set up the integrated project POSEIDON, a real time monitoring and forecasting system for the marine environmental conditions in the Aegean Sea. The integrated monitoring network of the system consists of 11 Seawatch oceanographic buoys, equipped with several sensors deployed at multi depths, and 9 Smart wave buoys with the ability of on-line transmittance to the operational centre of the HCMR every 3 h through Inmarsat-C satellite or a GSM mobile telephone communication system. Its enhanced forecasting system consists of an atmospheric model, an offshore wave model, a general circulation ocean model, a surface pollutant dispersion model and a shallow water wave model. To cover the demands of the system and assure the quality of the transmitted data HCMR established an in-house calibration laboratory for the evaluation and calibration of the oceanographic sensors and instruments used both in POSEIDON system and field surveys.

For temperature sensors there are two distinct levels in terms of calibration and standardisation. Calibration labs use a standard platinum thermometer to calibrate the sensors used in the field (second level) and every year or on well defined intervals of time or usage this reference sensor is standardised either by the manufacturer or by a certified facility using triple point method (first level).

HCMR calibration lab focuses only on the second level of calibration. Thus it uses a standard platinum thermometer manufactured by Seabird Electronics and a large temperature control bath. Due to the importance of the temperature measurements as a basic environmental parameter, the accuracy of the reference thermometer is a key factor for the overall performance of the calibration procedure not only for temperature but also for the majority of the field-measured parameters. Future plans are to integrate the whole

calibration procedure by setting up also the first level of calibration and become a certified metronomy laboratory.

*Some of JERICO partners operating calibration labs have developed both levels of calibration for temperature with a significant experience on the processes. In particular OGS uses TPW (*Triple Point of Water; 0.01 ℃) *and MPGa* (Melting Point of Gallium; 27.7646 ℃) *with high precision equipment while their acquired knowledge in the uncertainty estimation is pioneering within the network.*

The aim of this proposal is to have access on the first level calibration equipment in OGS and acquire the necessary knowledge, which will help us develop a similar facility in the future at HCMR.

Present the proposed experimental method and working plan

Although temperature sensor calibration is performed in the majority of the research centres in EU the OGS calibration lab is equipped with all the necessary precision equipment for performing the procedures following the international metrological standards and practises. The working plan will follow the steps keeping in mind that apart from the sensor calibration we aim to familiarization with the infrastructures and the equipment used in OGS:

Introduction: The HCMR team will be informed about the procedures, the equipment and the preparation actions needed to perform the temperature calibration experiment. Furthermore there will be a detailed discussion about the approaches and the practices that OGS and HCMR use to calibrate temperature sensors.

Experiment: The actual experiment will be performed with discrete and detailed steps in order to be well documented as a procedure. During the experiment several tests using different settings for the equipment under calibration will be done, aiming to detect the most effective one in terms of instrument configuration.

Data analysis: The data collected from the calibration experiment will be analysed using different techniques and approaches in order to minimize the sensor drift in the whole measurement range.

Conclusions: Both teams will contribute with conclusions and suggestions for improving the procedure. The overall goal is to be able to improve the SOPs used in HCMR for temperature calibration and to get familiar with precision equipment that may be installed in the future.

Indicate the type of access applied for

O remote	*(the measuring system is implemented by the operator of the installation and the presence of the user group is not required)*
O partially remote	*(the presence of the user group is required at some stage e.g. installing and un-installing)*
X in person/hands on	*(the presence of the user group is required/recommended during the whole access period)*

Indicate the proposed time schedule including expected duration of access time

*Five days (*one complete week of TNA access)*, between the June and December 2012.*

Host infrastructure

Indicate the type(s) of JERICO host facility(s) you are interested in
(Tick more than one if it is useful for your project)

O ferrybox O fixed platform O glider **X** calibration laboratory

Indicate the specific JERICO host facility(ies) you wish to choose

Centro di Taratura Oceanografica (CTO) of the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale – OGS located in Trieste.

Explain briefly why you think your project will be best carried out at the specified host facility(ies)

As shown clearly from the JERICOs WP4 questionnaires, concerning the calibration facilities of the network, the OGS personnel and laboratory is one of the most experienced and equipped for temperature sensor calibration following the international standards.

If possible, list other JERICO facility(ies) where you think your experiment could alternatively be carried out

Additional information

Is there a facility similar to the one you wish to utilize in your country?

X Yes O No

If yes, please indicate your reasons for requesting access to the JERICO facility you have chosen

Although the HCMR already performs temperature calibration experiments we use a very different approach in both the procedure and the equipment used. We aim through the experiment not only to calibrate our sensors but to exchange practises and experiences that would contribute in the improvement of our services. Furthermore the HCMR technicians involved would have the opportunity to get familiar with precision scientific equipment that we may purchase in the future.

Have you already submitted an Access Proposal to any of the participating facilities under this or previous EU Programs?

O Yes **X** No

If yes, please indicate the name of the institution, submission date and reference number for each such proposal

Is this a resubmission of a previously rejected proposal? *(Select "yes" if this application is a revised version of a proposal submitted to JERICO before that was rejected by the Selection Panel)*

O Yes **X** No

If yes, please give the exact reference number and submission date. Kindly describe briefly the changes made in comparison to the rejected version.

Is this a continuation of an earlier project funded under a previous call for Transnational Access in JERICO at the same facility?

O Yes **X** No

If yes, please give the exact reference number and submission date. Kindly indicate also what has been achieved in the previous experiment and the reasons why the objectives have not been fully met.

PART 4: Technical information

Wherever possible, please specify your requests regarding the use of your chosen facility's equipment/instruments/sensors, including any additional services, data or other requirements.

The HCMR team will need the calibration facility and all the appropriate equipment in order to perform a validation experiment and a calibration procedure if it is necessary, for the reference temperature sensor of the HCMR.

List all material/equipment you plan to bring to the JERICO facility (if any):

2 Deep Ocean Standards Thermometer SBE 35 by Sea-Bird Electronics, Inc.

Please provide a detailed and realistic budget for the expenses you expect to incur for travel/boarding and the shipment of equipment, if applicable in your case *(note that a maximum of two travel grants will be assigned to each user group, depending on the length of the requested period of stay).*

1. Travel to Trieste to perform the experiment, 2 persons, including flight, hotel and subsistence:
*350 (Tickets)+ 5 days*120 (Hotel) +6 days*75 (Subsistence) = 1.400 euros per person (2.800 for 2 person).*

2. Shipping cost of 1 box with sensor and equipment for the experiment: 400 euros

Total: 3.200 *euros*

Please tick the appropriate boxes and give detailed information for the kind of risks associated with your proposed activity

☐ Chemical :
☐ Biological :
☐ Radiological :
☐ Other :

Date of compilation 20/03/2012

Signature of the PI

Signature of an appropriate authorised person
(e.g. Head of Department, Research Office) _____

This section reserved to the JERICO TNA Office

Date of proposal receipt by email _____

Assigned reference number _____

Signature of receiving officer _____

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