



Thematic Actions

Coordinating Universities for the Proposal: UCM and UPM

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| Title of Action | Creation of a Network for Atmospheric Pollutant Dispersion Modelling | | |
| Participating partners | UCM, UPM, CIEMAT | Other participants | |
| Personnel involved (indicate institution) | UPM (School of Mining. Department of Mathematics Applied to Natural Resources, Research Group: Numerical Simulation of Natural Phenomena). UCM (Faculty of Physics. Department of Earth Physics, Astronomy and Astrophysics II) MCAM Group (Meteorology, Applications and Climate Modelling). CIEMAT. Environment Department. Atmospheric Pollution Unit. Atmospheric Modelling Group. | | |
| Start date | 1-1-2010 | End date | 31-12-2013 |
| Cluster | Global Change and New Energies | Other clusters | |
| Areas of action | Teaching Improvement and EHEA Deployment / Research / Knowledge Transfer / Local and Territorial Interaction | | |
| Location | Moncloa Campus (CIEMAT, EBM, UCM-FÍSICAS)) | | |
| Infrastructures involved | Current laboratories of the research groups involved | | |
| Keywords | Atmospheric modelling; Numerical methods; Meteorology; Air pollution; Supercomputing. | | |
| <p>Objectives:</p> <p>The objectives of this network are to combine the capacities of each group involved in order to develop and improve advanced atmospheric models, include the latest recent development in physical and chemical processes, along with the most advanced numerical techniques for solving equations. The network will also conduct research into modelling for meteorology and pollutant dispersion on several scales: local, street, urban, mesoscale and macroscale (hemispheric and global). These developments can be applied to the atmosphere of the Earth and other planets.</p> | | | |
| <p>Description of the action:</p> <p>This network is a cooperation initiative among research groups belonging to the two main universities of the Moncloa Campus and another group from one of the public research institutions located there. The R&D activities would be to research:</p> <ol style="list-style-type: none"> 1. Atmospheric processes, including the planetary boundary layer in rural and urban areas. Use of powerful Tools for CFD-RANS and LES numerical simulation. 2. Chemical processes in order to gain a better insight into pollutant formation (ozone, secondary aerosols, etc.) and their evolution in the atmosphere. 3. Advanced numerical techniques (i.e. meshfree numerical methods) to improve the solution of fundamental equations of atmospheric models and to optimise computing times. Use of CIEMAT supercomputing. <p>With respect to teaching, new specialist courses on atmospheric modelling would be developed and included in Master's and PhD programmes in both universities, such as the School of Mining Engineering's Master's and PhD programme on Environmental Research, Modelling and Risk Analysis.</p> | | | |
| <p>Planned key results:</p> <p>This action will:</p> <ul style="list-style-type: none"> • Notably increase the scientific capacity of the groups involved through the sharing of the different specialisations of each group in order to achieve the objective of developing and improving advanced atmospheric models to be implemented in meteorology, air quality, climate change and the study of other planet's atmospheres. • Promote the exchange of ideas among the groups and to be a start point for organising joint events. | | | |



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| <p>Rationale for the action:</p> <p>This action is needed because it will allow the groups involved to work together using their complementary experience in atmospheric physics and chemistry and numerical calculus. This synergy will enable the joint results to clearly surpass those achievable by each group working alone. It will also allow the creation of a prestigious centre to attract R&D in atmospheric modelling at national and international level.</p> | |
| <p>International aspects:</p> <p>With regard to research, this action has a very important International scope due to the foreseeable increased competitiveness of the groups involved in the area of international cooperation in atmospheric modelling. Furthermore, it will allow the organisation of international conferences in atmospheric modelling on the Moncloa Campus, such as the HARMO14 conference planned for 2012.</p> <p>With respect to teaching, there are plans to organise Master's degrees with international cooperation, which are considered to be key in the success of the Moncloa Campus.</p> | |
| <p>Planned impact:</p> <p>The impact of this proposal will be focused on the capacity to develop new atmospheric mathematical models, which could be used to obtain better atmospheric simulation, improving, among other things,:</p> <ol style="list-style-type: none">1. Metrological forecasting, reducing uncertainties and, hence, producing an important economical and social impact (extreme event prevention, etc.).2. Air quality assessment and forecasting, giving rise to a notable social and health benefits for humans.3. The design of plans and strategies for air quality improvement, energy saving and urban comfort. <p>This would position the Moncloa Campus on a level of competitiveness with respect to R&D in atmospheric modelling on a par with the leading European campuses. In addition, the Moncloa Campus would become a centre of attraction for R&D in atmospheric modelling for national and international students, professors and scientists.</p> <p>Due to the large social and economical demand concerning meteorology and air quality, the creation of new spin-off companies using the new developments of this action for environmental consulting is quite feasible.</p> | |