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INGV-DPC

Bearbeiter

Jörg Keller

22. April 2005

Re: Review statement for the volcanological research projects in the frame of "INGV-DPC Projects 2005-2006 in Volcanology".

The package "INGV-DPC Projects in Volcanology for the years 2005-2006" comprises 5 Projects on active or potentially active volcanic fields in Italy. Subdivision of the central project V3 in 7 substantial sub-projects results in reality in 11 volcanological projects covering an extremely broad spectrum. Hazard, precursor recognition and criticality levels are the final objectives in the interest of Civil Protection purposes.

Major FOCI of the whole INGV-DPC Projects are:

- Understanding the present status and the past history of the volcanic fields.
- Quantitative modelling and numerical simulation of systems and processes
- Recognising precursors and develop possible hazard scenarios.

Data bases for the past eruptive history appear as a goal in one form or the other for most of the studied volcanic areas.

Quantitative modelling and numerical simulations play a dominant role in the proposal wherever their application is justified by the available data sets.

A statement to the following issues is requested:

- a) Consistency of the proposed projects with the "Allegato Tecnico".
- b) Internal consistency of projects, feasibility and justification of requested funding.

The basis for this evaluation are the following documents made accessible for this purpose end of March 2005:

Agreement INGV-DPC projects in Volcanology ("Convenzione Quadro").

Progetto INGV-DPC Projects 2005-2006 Vulcanologia, 154pp.

From the documents it becomes evident that, starting with the Convenzione-quadro DPC-INGV and a general call for proposals, a process of extensive exchange, discussion and co-ordination of a great number of proposals has structured the voluminous proposal package into about 160 research groups (URs). This re-iterative and obviously very professionally co-ordinated process has led to a two-year plan that can be called exemplary in volcanology. The number of institutions and of researchers (953!) involved underlines the importance and priority that volcanology has in Italy.

The projects cover extensively the hazard relative aspects of the Italian active volcanic areas. The whole project proposal involves a great majority of all research groups in Italian institutions in the field of volcanology. This endeavour integrates different disciplines in a multidisciplinary effort to understand the volcanic processes threatening the population. It thus reflects the high standard of the national volcanological research. In addition collaboration with foreign experts and institutions enlarges the approach where necessary or desirable. A roughly estimated number of 50 non-Italian institutions co-operate.

The present INGV-DPC Project is particularly strong in the clear definition of expected research products, the "Deliverables" of the proposal. Thus, the proposals define for each single project first the present state of the art and present knowledge, then the priorital objectives and goals. The description of the envisaged activities and a work plan are followed by the "List of deliverables", grouped in precisely defined Tasks and Responsibilities. In view of the complexities of approaches it seems of crucial importance to see the responsible reporters for each task clearly indicated. The responsibility for delivering the results at the end of the two-year term is clearly expressed and in the hands of the individual UR Co-ordination. It will be important that these persons can exert a certain authority upon their related sub-URs. This seems given by the obligation for a substantial progress report after one year, and before allocating funds for the second year.

The financial requests differ according to methodical needs of the single tasks. They had also their limits in the total budget available. Budget limitations must have also led to shortening, pooling and even non-consideration of proposals.

As a final result the co-ordination process has led to a high degree of reasonability of requested funding. The total financial requests are justified and seem well balanced and divided between the different voices and the funding years.

Thus, the proposal as a whole presents a convincing document of research priorities for understanding, modelling and simulation of the addressed volcanic systems with a clear focus on hazard evaluation. Accordingly, each project includes a substantial part devoted to hazard assessment and to the definition of precursor recognition and criticality levels. The foundation of hazard considerations is recognised to be in the thorough understanding of the history and evolution of the volcanic systems.

PROJECT V1: Research activity at Stromboli

This project V1 results from initiatives started or substantially increased as an immediate reaction to the Stromboli crisis 2002-2003. These GNV projects are well advanced and are in part close to the final reporting stage. Funding seems accorded until 2005. Main focus of 6 sub-projects is on the morphological and structural stability of the entire SdF volcanic system, the sea-wave hazard and the dynamics and evolution of the magmatic system towards the eruption of 2002-2003.

PROJECT V2: Monitoring and research activity at Stromboli and Panarea

Important aspects of the project V2 are a direct continuation and extension of the ongoing GNV sub-projects at Stromboli (now under V-1).

Stromboli and Panarea are here linked through the close timing of the 2002-2003 events and the possible structural relationship as indicated by the 2002-2003 fracturing.

Ongoing research projects on Stromboli are complemented by new approaches that include structural analysis and modelling, SdF deformation and a detailed volcanological interpretation of Holocene eruptive behaviour.

In its second part "Panarea", Project V2 responds to the degassing and fracturing crisis 2002-2003. It also reacts to the obviously limited hazard consideration for Panarea in the past. Understanding the most recent (Holocene) volcanic events and knowledge of the fracture field and fluid circulation pattern are the main focus of the involved URs.

PROJECT V3: Research on active volcanoes, precursors, scenarios, hazard and risk

V3 is subdivided into 7 sub-projects that comprise all volcanic fields of Italy considered of immediate hazard relevance. These are:

V3-1 Colli Albani CA

V3-2 Campi Flegrei CF

V3-3 Ischia ISC

V3-4 Vesuvio SV

V3-5 Vulcano VULC

V3-6 Etna ET

V3-7 Pantelleria PANT

Grouping all seven Research projects on active volcanoes as sub-projects under the one heading "*active volcanoes, precursors, scenarios, hazard*" underlines the focus of the convention.

All volcanoes of the project groups V3-2 to V3-6 (on CF, ISC, SV, VULC and ET) are particularly notorious as dangerous volcanoes. The Tasks can build upon intense research of the foregoing years. Integrating present knowledge with the new results the two-year project term will definitely lead to a

substantial increase in our understanding of these volcanic systems. It can therefore be envisaged that the goals for all sub-projects can be achieved.

V3-1 Colli Albani and V3-7 Pantelleria are here added to the list of active fields to be considered in the hazard context. Given the recent manifestations and the possibly very young volcanic activity this is definitely justified. Pantelleria stands also for a broader area of the Canale di Sicilia. Base line and background data for the seismic and geothermal manifestations in these V3-1 and V3-7 areas are necessary and needed for assessing their potential hazards. In relation with these two areas, but of general importance for all recent volcanoes, is the dating of young volcanic rocks. This is mentioned here because I feel (but might be completely wrong) that the possibilities in Italy are inadequate in this moment compared with the level of the international top laboratories . For the hazard evaluation in potentially active fields, precise dating with the most advanced radiometric techniques (AMS C-14, but in particular Ar-Ar of *very young* volcanic rocks, LA Laser Ablation Ar-Ar, single-crystal LA Ar-Ar) is of foremost importance. This need has been recognised by several URs (e.g. V2, V3-1, V-3-3, V3-4) and co-operation with leading geochronology labs (Gif-sur-Yvette, Amsterdam, Berkeley?) is proposed. This can only be encouraged and supported.

PROJECT V4: Conception, verification, and application of innovative techniques to study active volcanoes

The general title of this project opens a wide field. Essential aspects of this project concentrate on the development of new approaches in the fields of quantitative probability models, high resolution imaging of the volcanic system and development of a real-time connection of seismic and thermal signals. 14 URs co-operate to achieve the well-defined deliverables of the 3 tasks.

PROJECT V5: Research on the diffuse degassing in Italy

Research on diffuse degassing in volcanic and non-volcanic areas of Italy has received world-wide recognition and reputation. With this splendid backing on previous and ongoing research of different groups the tasks of V5, in particular the data acquisition for an Italian catalogue of gas emissions and a detailed assessment of CO₂ vulnerability and hazard scenarios, will represent an important result of V5.

In the summary of the above, it can be said that Italian volcanology presents with this "**INGV-DPC Projects 2005-2006 in Volcanology**" an impressive document of research potential and research activity. A promising work-plan for volcanological research is in its comprehensive aspects calibrated against the needs of the volcanic hazard evaluation posed by the active volcanoes of the territory.

The project is scientifically sound and shows the necessary high level of internal consistency of individual projects and their multidisciplinary and international interrelationships. It presents itself as a well co-ordinated project with clear, well-defined objectives and deliverables.

Given the high level of knowledge through foregoing research, the feasibility and attainability of the defined (quite ambitious) goals seem confidently guaranteed. Also the reasonability of requested funding can be judged very positively.

Consistency of the proposed projects with the "Allegato Tecnico" is documented by the very general presence of the hazard aspect in work plans, tasks and deliverables.

Most proposal descriptions stress the importance of exchange between the various URs engaged in the same fields of the 5 INGV-DPC headings. But also the regular scientific contacts between all URs through workshops on horizontal themes and annual reporting meetings for larger parts of the entire project are addressed.

Given the large number of involved URs, this is certainly an ambitious task but should be strongly encouraged. The requested funding for this purposes is well justified.

The importance of international exchange and co-operation is also mirrored in the budget requests collectively grouped under "Missione al Estero".

A certain number of proposals from researchers who answered the call for proposals could obviously not be included at this stage. The decisions are an outcome of budget restrictions, but include considerations of overlap, priorities with respect to the INGV-DCP Agreement and with defined research tasks. Considered was also the general compatibility and significance in the frame of the whole project. These, certainly sometimes difficult decisions had to be proposed by the co-ordinators of the individual tasks and can, in the overall view, appear necessary and supportable.

The Agreement addresses also the question of an Italian TASK Force for risk mitigation on volcanoes in other parts of the world. Such a Task Force will on one side make available the knowledge of Italian volcanologists in crisis situations elsewhere. It will on the other side add world-wide experience to be applied in the Italian hazard volcanoes. As far as I could see, this idea of the Task Force does not re-appear in any project proposal or UR. However, it is clearly part of the overall consideration and could be part of the conclusions when evaluating the final outcome of the "INGV-DPC Projects in Volcanology for the years 2005-2006".

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22.04.05

Freiburg,