published in:
International Workshop on Modelling & Applied Simulation (MAS) at the conference "International Mediterranean and Latin American Modeling Multiconference" (I3M), September 23-25, Puerto de la Cruz, Tenerife, Spain; Editors: O. Balci, I. Castilla, F. Longo, M. Massei; p 15-17

PUBLIC FUNDING OF MODELLING AND SIMULATION IN AUSTRIA

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ABSTRACT
The first two calls of the funding initiative ModSim Computational Mathematics showed that there is a high variety of different areas already addressed by Austrian research institutions and companies. It has turned out that the initiative is important to reduce the gap between high level academic modelling and simulation and the commercially relevant use of the tools. The number of high quality proposals is not sufficient to use the full amount of available funding money at once, and it shows us to make smaller calls with a call volume.of about € 2 Mio. .The public intervention for modelling and simulation is justified by the vision to change the behaviour of the company partners in the long run. The aim is to implement modelling and simulation as a standard tool in the every-day business of Austrian companies. Beside the technical innovations, ModSim wants the funded institutions to establish long-term structures for a broader usage of modelling and simulation.

Keywords: computational mathematics, funding, Austria, economy

1. INTRODUCTION

ModSim is an initiative of the Austrian Federal Ministry of Transport, Innovation and Technology (bmvit) in co-operation with the Austrian Research Promotion Agency (FFG). In Austria, the level of academic research in mathematics is rather high compared to other Sciences (FWF 2007). As the Austrian federal ministry for transport, innovation and technology is responsible for promoting the use of innovative technologies by Austrian companies on the long term, it decided to stimulate the knowledge-transfer from mathematics to the companies by exploiting their expertise in computational mathematics. For this purpose a funding initiative was initiated: "ModSim Computational Mathematics - Developing New Applications of Modelling and Simulation for Austrian Business and Research". In ModSim, the term "computational mathematics" is seen as the combination of mathematics, computer sciences and the specific field of application. Following that scheme, it is obvious, that the funded projects should be run by research institutes and industrial partners in close cooperation.

2. SETUP OF THE FUNDING INITIATIVE MODSIM

The funding initiative was planned and prepared by the bmvit. The FFG conducts the overall programme management of ModSim. The funding is based on the directive for research, technology and development ("FTE-Richtlinie", BMVIT, BMWA 2007) in accordance with EU laws. The initiative was introduced to the research community both at research institutions and at companies in the year 2008. In the first two calls three kinds of funding schemes could be chosen by the applicants: 'Stimulation', 'Cooperative RTD' and 'Development of Human Resources'

2.1. Situation in Austria

In Austria the technological field of Modelling and Simulation has a strong presence and strengths, where scientists can gain challenging funding instruments, which function as a screening and amplification tool. The multidisciplinary cooperation of mathematics and medicine, metallurgy , public economics, etc. in the academic sector functions well. Researchers have a strong ability of organisation and leadership. In Industry Modelling and Simulation in Austria is not well developed, as the users needs a high absorption capacity because of a complex process of harmonization and intervention between the way of posing and solving a problem. Concerning funding in Austria Modelling and Simulation needs an expanded framework: scientific quality as a condition, efficiency in structure as a goal.

2.2. General aspects of funding and aims of ModSim

The two aims of the funding initiative ModSim are:

- Intensify the challenging use of computational mathematics in the Austrian business and research
- Setup and development of structures for research and development with the purpose of long-term transfer of knowledge between

science and economy in the area of Computational Mathematics

The proposing institutions have to be located in Austria. Minor contributions of foreign partners are also possible. The proposed applications should cover total costs of 500.000,- € each or more. Depending on the content also smaller projects are worth being funded. The three different funding schemes support the initiative to reach its aims:

- Stimulation projects aim to stimulate the high-level application of Computational Mathematics according to the aims of ModSim. In case that such projects are research projects, they lead up to a functional research-prototype (whereas product development cannot be funded).
- Projects of the type 'Cooperative RTD' are co-operative research and developing projects with structural development at the project partners. These projects lead up to a functional research-prototype (whereas product development cannot be funded).
- In projects of the type 'Development of Human Resources' existing organisational structures for research and the use of Computational Mathematics should be improved or built up.

2.2.1. Evaluation criteria and process

Like in all other FFG-operated funding programmes, four main criteria are relevant for the decision of funding:

1. Quality of proposed activity
2. Relevance of proposed activity to the ModSim-aims
3. Suitability of applicants / partners
4. Economic potential and exploitation

A jury evaluates whether the proposals fulfil these criteria. Each of the criteria has to be fulfilled independently. The jury consists of 4-9 international experts in the field of computational mathematics and/or in one of the application fields. In the ideal case each jury member has knowledge and experience in organisational affairs in the research area.
The targeted composition of the jury is:

- One third of experts from industry,
- One third of experts from academia
- and one third with a broad knowledge and experience in structural / organisational issues (e.g. Deans of Faculty, Heads of Research Centres).

Within the framework conditions set by the bmvit, the jury is free in its decisions and independent in drawing up its recommendation, including any obligatory conditions on the proposers. The jury decides on the basis of the evaluation manual, in which the evaluation process and selection criteria as well as assessment mode are laid down. The basis for the evaluation is the submitted applications.

The funding recommendation formulated by the jury is transferred to the bmvit. The bmvit decides about the funding.

3. RESULTS FROM THE FIRST CALLS

3.1. Applications

For the first two calls the amount of € 7 Mio. was available. In the first call, 13 proposals from several fields of applications where submitted. In the second call 18 proposals were submitted. Table 1 shows the number of applications with respect to the type of funding scheme chosen by the applicants.

Table 1: Overview of the Applications in ModSim

	Coop. RTD	Stim.	Dvlp. of HR	sum
1st Call	8	4	1	13
2nd Call	8	8	2	18
sum	16	12	3	31

3.2. Funded Projects

From the submitted proposals 13 where chosen for funding by the ministry. The funded projects use the sum of 4.4 Mio €. They deal with several application areas of computational mathematics (alphabetic order):

- Automotive
- Building industry
- Economy
- Logistic, Logistic for public health
- Manufacturing technology
- Material science
- Mechatronics
- Medicine
- Meteorology
- Timberwork

The funded projects have total costs between 127000,- € up to 1 Mio. €.

3.3. List of funded projects from the first call:

In the first call, six proposals where chosen to be funded and they already started their work. The titles of the funded projects are:

- M-CFD - Meteodisciplinary Computational Fluid Dynamics
- MIMOSA - Multi Non-Linear Structural Condition Modelling and Assessment

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- RoWaFlowSim - Simulations of liquid film flows with free surface on rotating silicon wafers
- MEDVIS 3D - Blood Flow Simulation in Intracranial Aneurysms
- ATHDM-E3 - Austrian Hybrid Dynamic Model E3
- AtoMat - Atomistic Approaches towards Materials Design

The results from the second call were not officially release and therefore not publishable at the time of submission of this paper. You will find the results on the homepage: www.ffg.at/modsim

4. CONCLUSION AND OUTLOOK FOR MODSIM

4.1. Conclusions from the first two calls

Considering the results from the first two calls, the following conclusions can be identified:

- Modelling and Simulation is used in very different application areas in Austria.
- The number of proposals of sufficiently high quality is not high enough to make use of the total money available for funding at once, and it shows us to make smaller calls with a call volume of € 2 Mio.
- The increasing number of applications in the second call shows the ongoing demand for public funding for modelling and simulation.
- The degree of co-operation between research institutions and companies is very high.
- Stimulation projects were more popular in the second call than in the first one.
- Stimulation projects have the highest funding rate considering the number of applications and funded projects.
- Projects for 'Cooperative RTD' are the biggest ones.
- The aimed project size could be reached; nevertheless a big variety of the size of the applications is present which makes it difficult for the jury to compare the projects with each other.

4.2. Third call of ModSim

It is planned to offer a third call for proposal in the ModSim initiative. The results from the first calls will be used to further improve the efficient use of the funds for improvement of the Austrian researchers in research institutions and companies. Information about this will be available on www.ffg.at/modsim

4.3. European funding for Modelling and Simulation

On european level Modelling and Simulations gets funded by top-down calls within the priorities "ICT" (Information and communication Technologies") and NMP ("Nanotechnologies, Material and Production technologies") of the 7th Framework Programme. Austrian participation in ICT is quite successful. With the begin of the 7th Frame work programme 3,5 % of the overall successful participants wihin ICT came from Austrian research institutions, universities and companies. Due to the economic crisis the European Commission has launched a PPP ("Public, Private, Partnership") Initiative for Manufacturing (Factories of the Future"-FoF) as joint call between ICT and NMP, where Modelling and Simulation plays an important part. Austria will build up a national Plattform with the goal to evaluate research topics with are important for Austrian stakeholders, to bring them into the workprogramm of the FoF-initiative, to build up critical mass and in a long term to further more increase participation. of Austrian stakeholders.

ACKNOWLEDGMENTS

The work described in this paper is financed by the bmvit.

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published in:

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