



Research Success Stories



November 2012

Improving the steering part of satellites

The project ELSA - European Levitated Spherical Actuator - aims at developing an innovative satellite attitude and orbit control system (AOCS). For the coordinator of the project, CSEM from Neuchatel, it is a chance to enter a niche market.

The ELSA project has the goal of improving European capacity to independently manufacture commercial and scientific satellites by bringing a new actuator for attitude and orbit control systems to a higher level of maturity. This goal is in line with ESAs technology strategy and long term plan. Support for initial development activities for this innovative actuator technology was provided within the framework of ESAs GSTP program. In other words, once a satellite is in space its attitude, i.e. its orientation towards the earth or another point in space, needs to be constantly stabilized. CSEM (*Centre Suisse d'Electronique et de Microtechnique*) already showed the feasibility of a new kind of AOCS equipment that would make



Dr Emmanuel Onillon
 CSEM
 ELSA Coordinator

this stabilization of attitude more efficient and reliable. So the company wanted to take this project one step further, looked for other funding possibilities – and found it in the Space programme of the European Commission.

Bearable administrative burden

“The application process was time consuming”, says Emma-

“The administrative burden of this project is not too heavy.”

nuel Onillon, the project coordinator. “You have to expect two months for drawing up a proposal.” However, his company had the resources to cover the costs of the application process and “there are several of us who

ABOUT THE PROJECT

The position of a satellite towards the earth or another point in space needs to be constantly stabilized. This can be done by “reaction wheels”: If such a wheel is accelerated, it can move a satellite around its center of mass. For redundancy and optimization reasons, four or five wheels are common (although, theoretically, three would be sufficient). ELSA is developing a single device that can replace these three or four devices: a sphere (controlled by magnetic levitation) that can be accelerated in any direction. As only one sphere is needed and as there is no mechanical friction, the new device is expected to be more reliable, lighter and consuming less power than other systems.

write up such proposals”. According to him, the administrative burden of coordinating such a project is not too heavy. Which is probably also due to the fact that the company had already collaborated with all of the project’s partners before, so collaboration is more likely to be smooth.

Innovation to enter a niche market

Satellites are not the kind of products that are produced and sold everywhere, so the market is relatively small.

“And it is very difficult to enter”, says Emmanuel Onillon, “as you have to prove very conclusively that your product is extremely reliable, and for that you have to participate in scientific missions” – which are not taking place all too often either.

But he is confident that they can enter this niche market because “it is not just an improved version of an old product, it really is an innovation, something that has not been here before”.

FACTS AND FIGURES

Project Name:	European Levitated Spherical Actuator (ELSA)
Research Area:	Research and development for space exploration
Principal Investigator:	Dr. Emmanuel Onillon
Coordinating Institution:	Centre Suisse d'Électronique et de Microtechnique
Start Date - End Date:	01.12.2011 – 31.05.2014 (30 months)
Project Cost:	3,143,391 €
Project Funding:	1,966,305 €
Project Reference:	283223
Contract Type:	Small or medium-scale focused research project

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