European Levitated Spherical Actuator

Fact Sheet

Project Information

ELSA
Grant agreement ID: 283223

Funded under
FP7-SPACE

Project website

Overall budget
€ 3 143 570,90

Status
Closed project

EU contribution
€ 1 966 305

Start date
1 December 2011

End date
30 November 2014

Coordinated by
CSEM CENTRE SUISSE
D'ELECTRONIQUE ET DE
MICROTECHNIQUE SA -
RECHERCHE ET
DEVELOPPEMENT

Switzerland

Objective

“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 ESA’s technology strategy and long term plan. Support for initial development activities for this innovative actuator technology was provided within the framework of ESA’s GSTP program.

The concept consists of a levitated sphere that can be accelerated about any axis producing a resultant torque in any direction. This system aims at replacing the three (or four) traditional reaction wheels or control moment gyroscopes commonly used in
satellites and spacecrafts. It reduces the mass and power supply allocated to the attitude and navigation unit. The mass and power saved can be allocated to the payload. The concept offers performance gain; it provides more momentum for a given system mass in comparison with the current inertial subsystems. It improves the system reliability as no mechanical bearings are present and allows more flexible mission planning.

This project, proposed for activity 9.2, ""Strengthening the foundations of Space science and technology"", topic SPA.2011.2.1-02, ""Research and development for space exploration"", comprises three phases.

Phase 1 will define the system specifications, based on an extensive market study of potential user’s requirements, and identify a reference mission that will provide requirements in term of attitude and navigation control.

Phase 2 will comprise the system design, manufacturing and integration, including a feasibility study of the steps necessary to spatialize the design and increase its technology readiness level. Where possible some of the identified spatialization steps will be implemented as part of this project.

The project will conclude with phase 3, which will include system tests and performance assessments to demonstrate the potential of the Reaction Sphere.

Field of science

/social sciences/economics and business/business and management/commerce
/natural sciences/physical sciences/astronomy/planetary science/satellites
/natural sciences/physical sciences/astronomy/space exploration

Programme(s)

Topic(s)

Call for proposal

FP7-SPACE-2011-1

Funding Scheme

CP-FP - Small or medium-scale focused research project

Coordinator
CSEM CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DEVELOPPEMENT

Address
Rue Jaquet Droz 1
2000 Neuchatel
Switzerland

Website
Contact the organisation

Administrative Contact
Emmanuel Onillon (Mr.)

Participants (5)

maxon motor ag
Switzerland
EU contribution
€ 558 605

Address
Brünigstrasse 220
6072 Sachseln

Website
Contact the organisation

Administrative Contact
Graziano Santarella (Mr.)

SENER INGENIERIA Y SISTEMAS SA
Spain
EU contribution
€ 156 635

Address
Avenida Zugazarte 56
48930 Getxo

Website
Contact the organisation

Administrative Contact
Juan Manuel Del Cura Velayos (Mr.)
<table>
<thead>
<tr>
<th>Organisation</th>
<th>Country</th>
<th>EU Contribution</th>
<th>Address</th>
<th>Activity Type</th>
<th>Website</th>
<th>Contact the organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIETE ANONYME BELGE DE CONSTRUCTIONS AERONAUTIQUES-S.A.B.C.A.</td>
<td>Belgium</td>
<td>€ 221 875</td>
<td>Chaussee De Haecht 1470 1130 Bruxelles</td>
<td>Private for-profit entities (excluding Higher or Secondary Education Establishments)</td>
<td><a href="#">Website</a></td>
<td><a href="#">Contact the organisation</a></td>
</tr>
<tr>
<td>CENTRUM BADAN KOSMICZNYCH POLSKIEJ AKADEMII NAUK</td>
<td>Poland</td>
<td>€ 228 450</td>
<td>Bartycka 18 A 00 716 Warszawa</td>
<td>Research Organisations</td>
<td><a href="#">Website</a></td>
<td><a href="#">Contact the organisation</a></td>
</tr>
<tr>
<td>REDSHIFT DESIGN AND ENGINEERING BVBA</td>
<td>Belgium</td>
<td>€ 77 309</td>
<td>Markt 21A 2840 Rumst</td>
<td>Private for-profit entities (excluding Higher or Secondary Education Establishments)</td>
<td><a href="#">Website</a></td>
<td><a href="#">Contact the organisation</a></td>
</tr>
</tbody>
</table>

Administrative Contact

Kathy Vekemans (Ms.)

Roman Wawrzaszek (Dr.)

Tom Beuselink (Mr.)