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Research Success Story



LEADING THE SECOND QUANTUM REVOLUTION

Sensors are where the real and the digital worlds meet. The power that quantum technologies will soon bring to this interface should revolutionise industry. The project “macQsimal” (Miniature Atomic Vapor-Cell Quantum Devices for Sensing and Metrology Applications), made up of 14 pioneers in the field of quantum sensors, aims to establish European leadership in this second quantum revolution.

Self-driving cars and miniaturised guides for surgical robots are only 2 of the applications of quantum sensors. To make sure that European companies are at the forefront of this technology, the European Commission launched the Quantum Technologies Flagship, a €1 billion research initiative. One of the first 20 projects to be funded is macQsimal. Coordinated by Switzerland’s CSEM (Centre Suisse d’Électronique et de Microtechnique), the macQsimal consortium brings together research institutes and companies across Europe to develop scientific breakthroughs in atomic quantum metrology and sensing.

CSEM as a catalyst

“Coordinating this major project has brought us visibility across Europe and will continue to do so,” says Dr. Jacques Haesler, a senior project manager at CSEM. CSEM, an innovation acceler-

ator based in Neuchâtel, was already known in Switzerland for promoting and accelerating the transfer of technologies and know-how from academia to industry. “And now we are getting feedback from institutions and companies across Europe, and even worldwide, who are interested in integrating our atomic cells in their research and products.”

“Both academia and industry now see the mutual benefit”

Preparing the quantum future

One of the strengths of the macQsimal consortium, Haesler says, is that it builds a double bridge. First, it is developing technology to bridge the real and digital worlds. Second, the consortium’s composition of academia and industry in itself creates a bridge. “Our collaboration works well

because both groups see the mutual benefit. In addition to developing new products, we will also be preparing for the next generation of quantum devices, determining where the future focus should lie and how much funding will be needed.”

Euresearch – a powerful ally

Haesler credits Euresearch with macQsimal being selected for funding and CSEM winning the role of project coordinator. “The people at Euresearch know what is going on in Horizon 2020 and were able to give us an early and valuable overview of the Quantum Technologies Flagship. Without them, we would not have succeeded in writing a winning proposal. We wouldn’t have known who to get in touch with or how to achieve the right balance between industry and academia.”

About macQsimal



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Senior Project Manager, CSEM

CONTENT SUMMARY

The macQsimal project intends to design, develop, miniaturise and integrate 5 different types of quantum-enabled sensors with outstanding sensitivity, in order to measure magnetic fields, time, rotation, electro-magnetic radiation and gas concentration. It employs a common core technology platform formed by atomic vapour cells realised as integrated microelectromechanical systems at the wafer level.

FACTS AND FIGURES

Project Name
Miniature Atomic Vapor-Cell Quantum Devices for Sensing and Metrology Applications

Research Area
Quantum sensing and metrology in vapour cells

Organisations
CSEM, Switzerland (Coordinator), University of Basel, University of Neuchâtel and 11 further partners

Start Date – End Date
01.10.2018 – 30.09.2021

Duration
3 years

Project Cost
€10.2 million

Project Funding
€10.2 million

Programme
Horizon 2020 Excellent Science: Future and Emerging Technologies (FET) Quantum Technologies Flagship

More Information
www.macQsimal.eu

Euresearch is an information and advisory service on the European Research and Innovation Framework Programmes. It has offices in all the Swiss regions and a Network Office in Bern. Euresearch is a non-profit association supported by the Swiss federal government.



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