

Fraunhofer Institute for Microelectronic Circuits and Systems IMS

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PRESS RELEASE

Advancing Medical Technology

ECG Chip for Real-Time Detection of Atrial Fibrillation Developed

The ARTEMIS project consortium has introduced an ECG chip capable of detecting atrial fibrillation (AF) in real time. Unveiled as a prototype at the COMPAMED trade fair in November, the chip generated significant interest among industry experts and professionals.

This innovative chip combines state-of-the-art hardware technology with artificial intelligence (AI) to reliably and efficiently identify heart rhythm disorders at an early stage. The analysis occurs directly on the body, and results are securely and rapidly transmitted to electronic patient records via 5G technology. This seamless integration into clinical care enables faster responses to critical findings.

"The future of medicine requires seamless collaboration between hardware, software, and medical expertise to achieve maximum benefits for patients," explains Caroline Reßing, Project Manager at Fraunhofer IMS. The Duisburg-based institute leads the development of a microcontroller based on RISC-V technology, enhanced with AI hardware accelerators. The chip, part of the AIRISC system, supports small neural networks created with the embedded framework AIFES® (Artificial Intelligence for Embedded Systems), developed in-house at Fraunhofer IMS. These networks are implemented directly in medical devices, enabling physicians to promptly identify potentially life-threatening conditions.

Atrial Fibrillation: Rapid Detection Saves Lives

Atrial fibrillation is one of the most common heart rhythm disorders in Germany, affecting nearly two million individuals. Delayed diagnosis can have severe consequences, significantly increasing the risk of stroke. The new EKG chip plays a vital role in mitigating these risks by enabling precise and early detection.

Collaboration for the Digital Healthcare of Tomorrow

Editorial Barbara Ward | Fraunhofer Institute for Microelektronic Circuits and Systems IMS | Telefon +49 203 3783 343 | Finkenstraße 61 | 47057 Duisburg | www.ims.fraunhofer.de | presse@ims.fraunhofer.de



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The ARTEMIS project, funded under grant number 13GW0579D by the German Federal Ministry of Education and Research (BMBF), exemplifies successful collaboration between industry and research¹. The consortium includes GETEMED Medizin- und Informationstechnik AG (consortium leader), Deutsches Herzzentrum der Charité (DHZC), CYIENT GmbH, SYNIOS GmbH, and Fraunhofer IMS. Together, the partners are committed to ensuring the successful implementation of project results beyond the three-year funding period.

The EKG chip represents a major milestone toward more efficient and personalized healthcare, showcasing the transformative potential of modern technologies in medical diagnostics.

¹ Funding Source: "Healthcare Economy" action field within the Health Promotion Framework Program.

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Pictures and captions





Ansicht eines ARTEMIS Chip Plots ® Fraunhofer IMS

Editorial