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Use of DESY's Open-Source FPGA Framework in the LISA (Laser Interferometer Space Antenna) Mission

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The Laser Interferometer Space Antenna (LISA) mission is one of the most ambitious space observatories developed by the European Space Agency (ESA) in collaboration with the National Aeronautics and Space Administration (NASA). Its objective is to detect low-frequency gravitational waves—signals that are otherwise undetectable from Earth due to environmental noise. These waves, which propagate through spacetime at the speed of light, are generated by massive astrophysical events.

DESY, through its MSK group, is contributing to this groundbreaking mission by developing a high-precision phasemeter system capable of measuring laser phase shifts. A key enabler of this development is the FWK framework—an open-source FPGA development platform specifically designed to support MicroTCA-based hardware in large-scale scientific applications. In this presentation, the role of FWK in the LISA project will be showcased, highlighting its impact on firmware development workflows, integration with MicroTCA hardware, and its value in facilitating FPGA development in the context of complex and demanding research infrastructures.

Summary

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