USE OF DESY'S FPGA FRAMEWORK IN THE LISA MISSION.

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HELMHOLTZ

Laser Interferometer Space Antenna (LISA) Mission.

- The objective of the LISA mission is to detect low-frequency **gravitational waves**.
- LISA will consist of three spacecraft exchanging laser beams arranged in a triangle formation.
- The **phase-meter** precisely measures gravitational waves by tracking tiny phase shifts in the laser light.

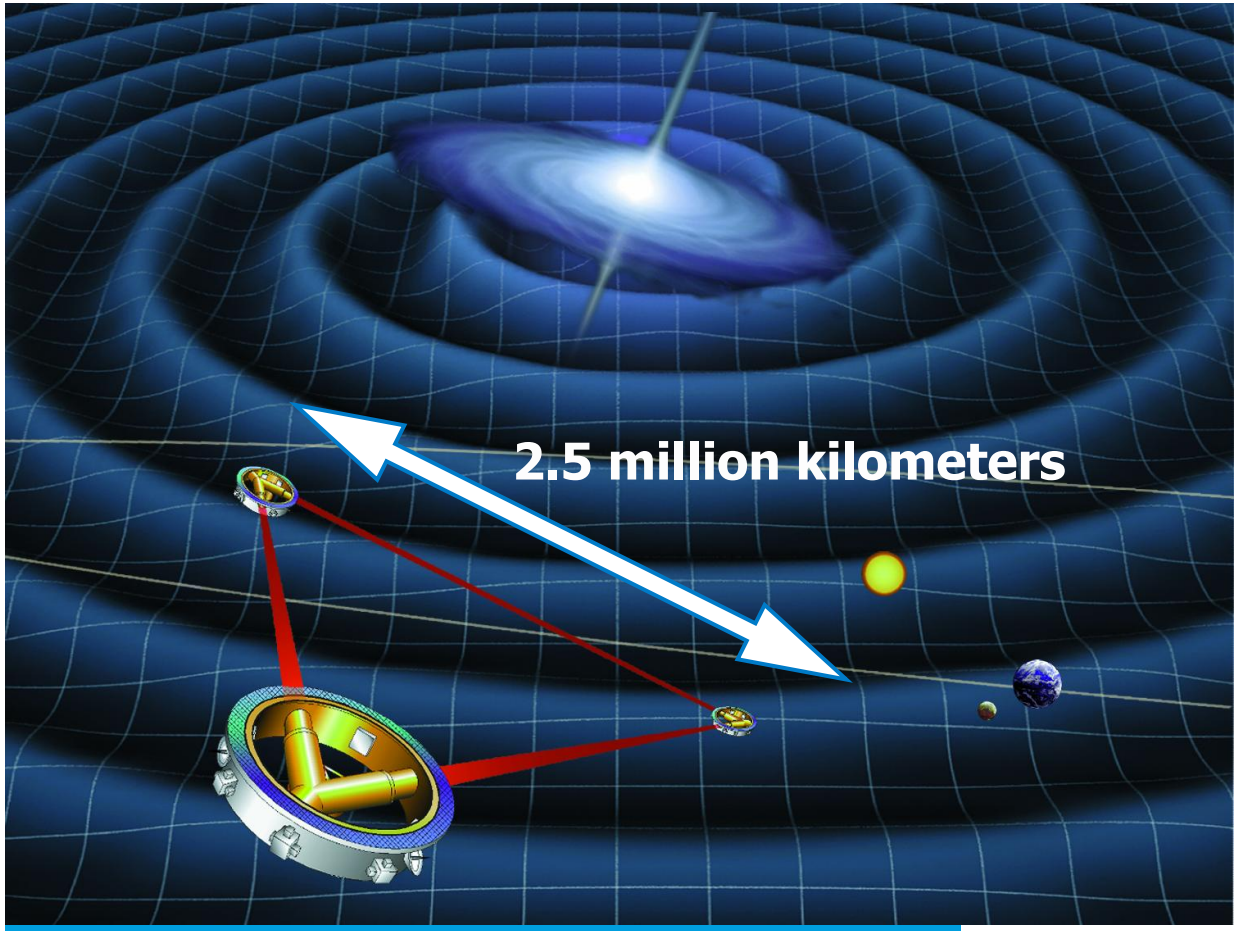


Figure: Three LISA spacecrafts in orbit, from [1].

[1] NASA Illustration of LISA, https://www.lisamission.org/.

DESY's role in the mission.

- DESY’s Machine Beam Control (MSK) Group has multi-year experience in MicroTCA board design and development.

- Open-source FPGA firmware framework (FWK).

FWK
FPGA firmware framework

[2] Cost-Optimized IO-Controller and Processing-Board: DAMC-FMC1Z7IO.

Figure: DAMC-FMC1Z7IO, fitted with a SoC from the Xilinx Zynq7000 family, from [2].

- MicroTCA & FWK combination enables **seamless transfer of technologies** from accelerator-based setups to other research applications.

What is the FPGA Firmware Framework?

- **Main goals**: standardize FPGA firmware project structure and project build process.

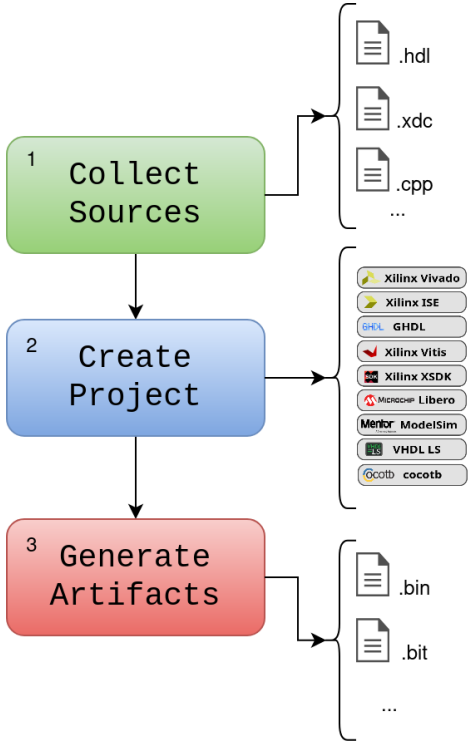
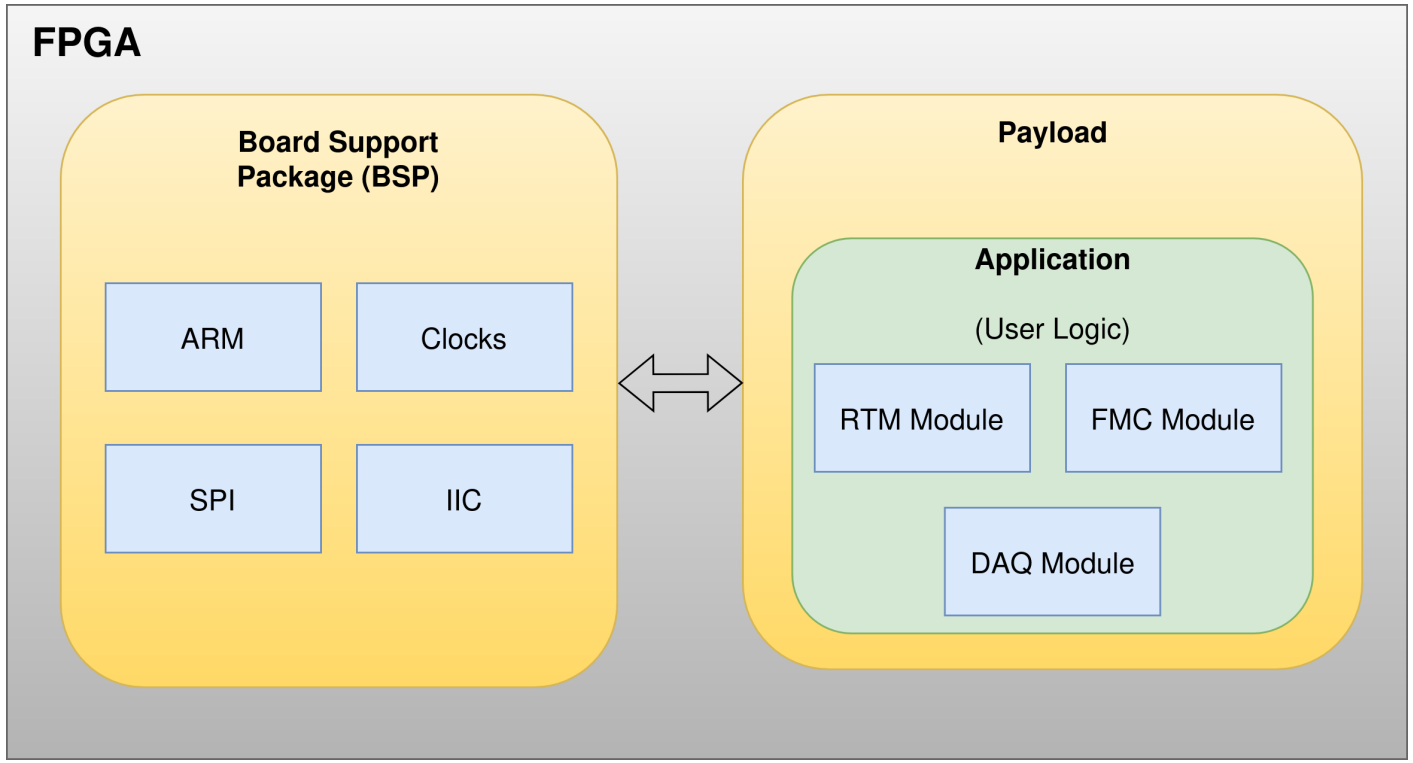


Figure: FPGA firmware framework workflow.



1. One Board Support Package (BSP) - Multiple applications.
2. Easy porting of existing applications to a new board.
3. **Open Source** BSPs available from DESY Gitlab.

Vielen Dank

Kontakt

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