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## Tutorial Lecture: FPGA Development for MicroTCA Platforms: Open-Source Tools and Best Practices

*Wednesday, 27 August 2025 15:40 (1 hour)*

Field-Programmable Gate Array (FPGA) development is a crucial component in the realization of applications based on MicroTCA systems. Engineers and researchers new to this standard often face significant complexities in handling Advanced Mezzanine Card (AMC) modules, particularly concerning interface implementation (e.g., PCIe, Ethernet, Point-to-Point links), algorithm development, and verification. These common challenges frequently lead to duplicated efforts and “re-inventing the wheel” for recurring FPGA development problems. This tutorial will introduce attendees to a suite of existing open-source tools and applications designed to accelerate these development efforts. We will provide practical tips and tricks for the initial bring-up of any AMC board featuring a modern FPGA. The session will feature concrete examples and established solutions deployed in experimental physics facilities across Europe, demonstrating how to avoid common pitfalls and streamline the development lifecycle.

**Presenter:** GUMUS, Cagil (DESY)