ELBE CW accelerator contains 2 NRF buncher cavities, 4 SRF TESLA cavities, 3.5-cell SRF-gun replacement of analogue system with MicroTCA.4-based controller

- **goal**: higher stability, greater flexibility, improved diagnostics, implementation of beam-based feedback

**Hardware Structure**

- modular MicroTCA.4 based system
- DS8VM1 board for 260 MHz buncher (direct sampling scheme)
- DWC8VM1 boards for 1.3 GHz cavities (NRF + SRF)
- external trigger provided and distributed by X2Timer
- 12-slot, 8U high rackmount chassis for all cavities

**Software Structure**

- communication to control system based on OPC-UA protocol
- fast channel for diagnostics to LabView expert panel
- slow control for operators by WinCC interface

**Performance studies - snapshot**

- preliminary performance tests show improved stability
- further optimization ongoing
- long-term tests planned from 09/2017

**New Setup with high performance CPU**

- high CPU load by 7 LLRF Servers + 1 Timer Server
- test setup with external high performance server
- 2x Intel Xeon E5-2690v4 14C/28T 2.60 GHz, 64 GB RAM
- NAT-MCH-PHYS80 with optical PCIe link

**Beam-based Feedback - Outlook**

- sequential, active beam-based feedback scheme
- stabilization of arrival-time, pulse duration, beam energy