Preliminary results of the new Event Timer with the IECS technologies

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Event registration technology developments at EDI

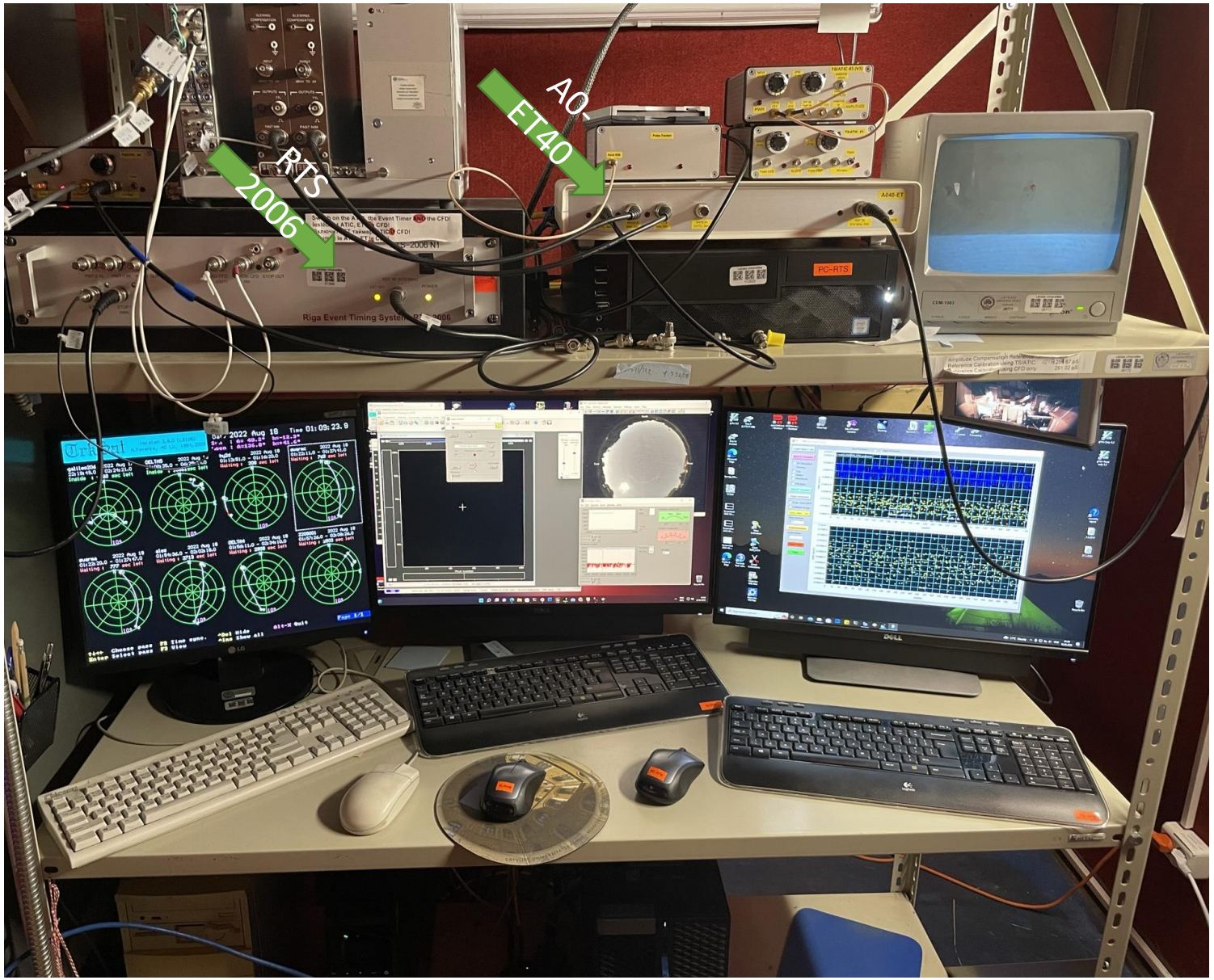
- EDI, in the scope of the project, is working on a new system for simultaneous time of arrival and amplitude measurement of nanosecond width pulses – Event Time and Amplitude Meter (ETAM).
- New timing technology is evolution of the A040-ET, which itself was derived from A033-ET in the scope of an earlier ERDF financed project.
- Employed pulse amplitude measurement technology is based on digitization of peak-detected signal.

Event Time and Amplitude Meter (ETAM) highlights

- Analog Event signal inputs (input A and input B):
  - -2V .. 2V range
  - User controlled threshold voltage
  - User selected Event edge (leading / trailing)
  - User selected Event pulse polarity (positive / negative)
- Simultaneous event pulse timing and amplitude measurement
- Greately improved timing stability in temperature
- Improved timing precision
- Improved built-in gate signal generator

Expected performance of EDI Event Time and Amplitude Meter (ETAM) - preliminary test results

	A040-ET	**ETAM (preliminary)**
Timing precision (RMSD)	2.5 – 2.7 ps typically	2.1 – 2.4 ps typically
Timing precision (RMSD) stability (Single calibration at 22.5 °C)	<4 ps (15 – 30 °C range)	<2.6 ps (15 – 30 °C range) <3 ps (5 – 40 °C range)
Single-input timing offset drift	<2 ps/°C	<1 ps/°C
Input-to-input timing offset drift	<0.2 ps/°C	<0.2 ps/°C
Dead time	50 ns	30 - 40 ns
Minimum input pulse width	700 ps	700 ps
Pulse amplitude measurement range (positive or negative)	-	50 mV – 2 V
Pulse amplitude measurement precision (RMSD)	-	<3.5 mV (2V pulse amplitude) <2.3 mV (1V pulse amplitude)
Pulse amplitude measurement accuracy	-	<50 mV (any shape and width pulse) <5 mV (if tuned for particular shape and width pulse)


RTS
2006
AO-
ET40
PC-RTS

Test setup and results

- Laser: EKSPLA 312/SH 10Hz, 532nm, 130mJ
- Primary detector channel: PMT → TS/Atic → RTS 2006(A0-ET32 based)
- Secondary detector channel HPD: → Ortec 9307 → A0-ET40
- Timing precision (timer scaling procedure): 2.42ps
- Calibration tests: similar performance as of A0-ET33

Thank you for your attention!

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INVESTING IN YOUR FUTURE

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