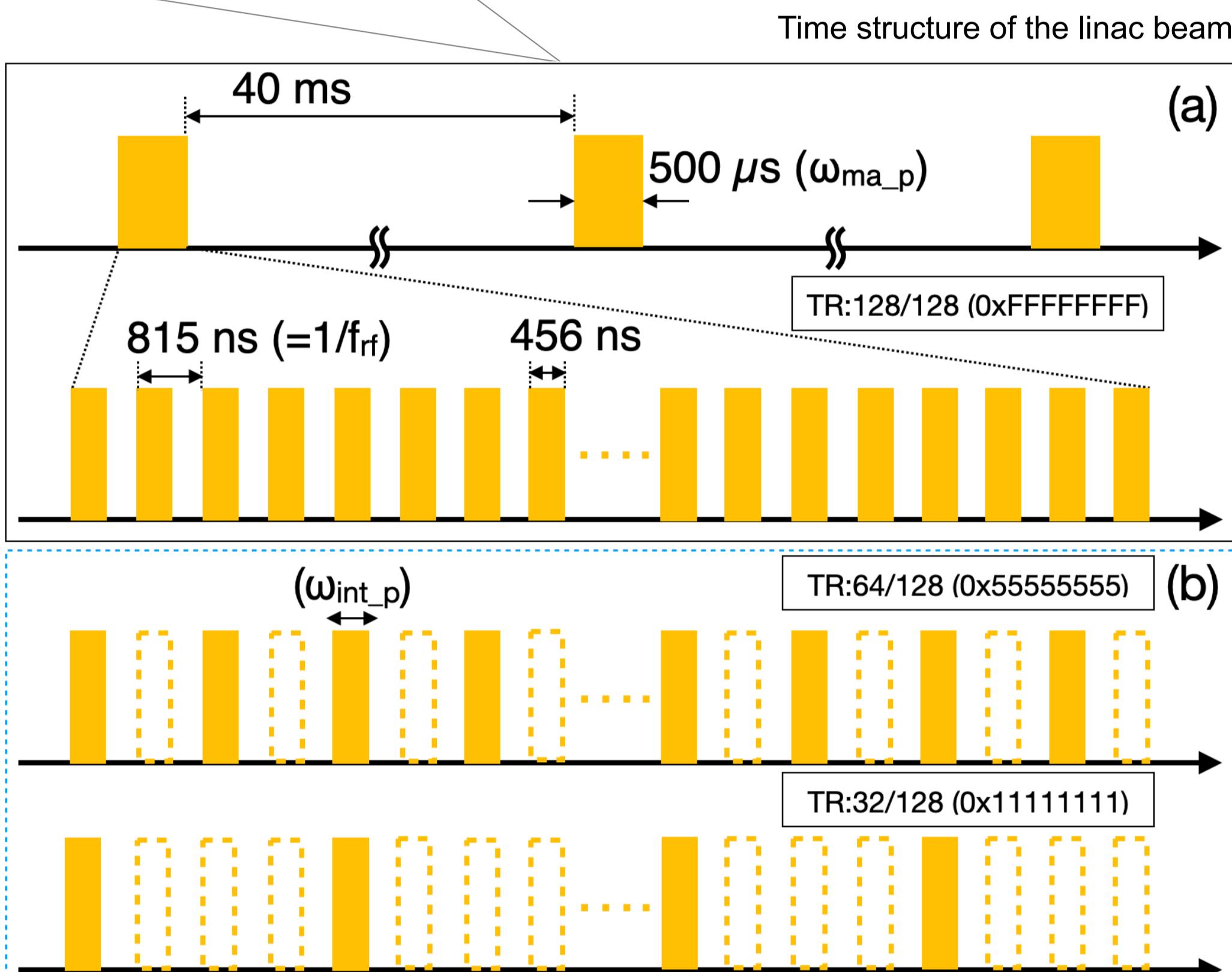


MOPORI02

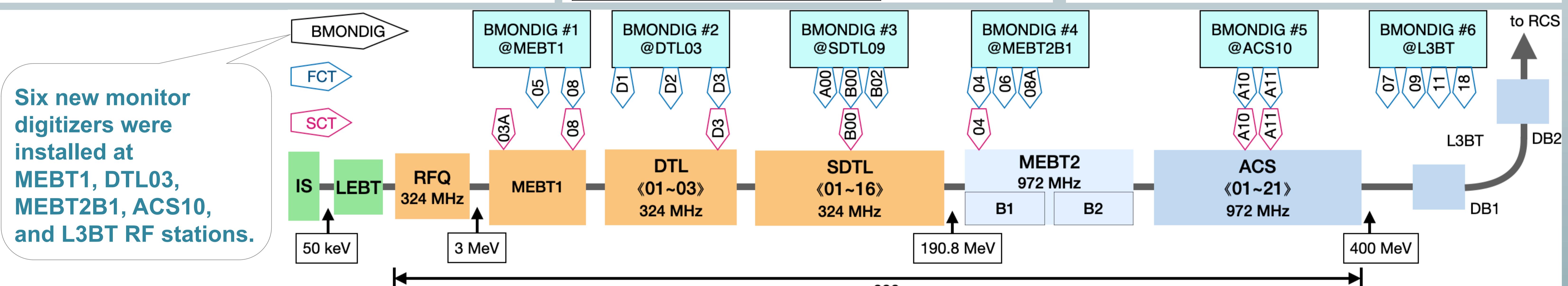
Introduction

- Several beam monitors at the linac;
 - Beam current monitor (slow current transformer, SCT),
 - Beam phase monitor (fast current transformer, FCT),
 - Beam position monitor (BPM).
 - Main objectives of beam monitoring system development;
 - Obsolescence,
 - Desire to monitor the entire macro pulse;

Challenging to perform signal processing in an FPGA during beam operation, with a general-purpose of digitizer
→→ a memory with ~50k points in FPGA.

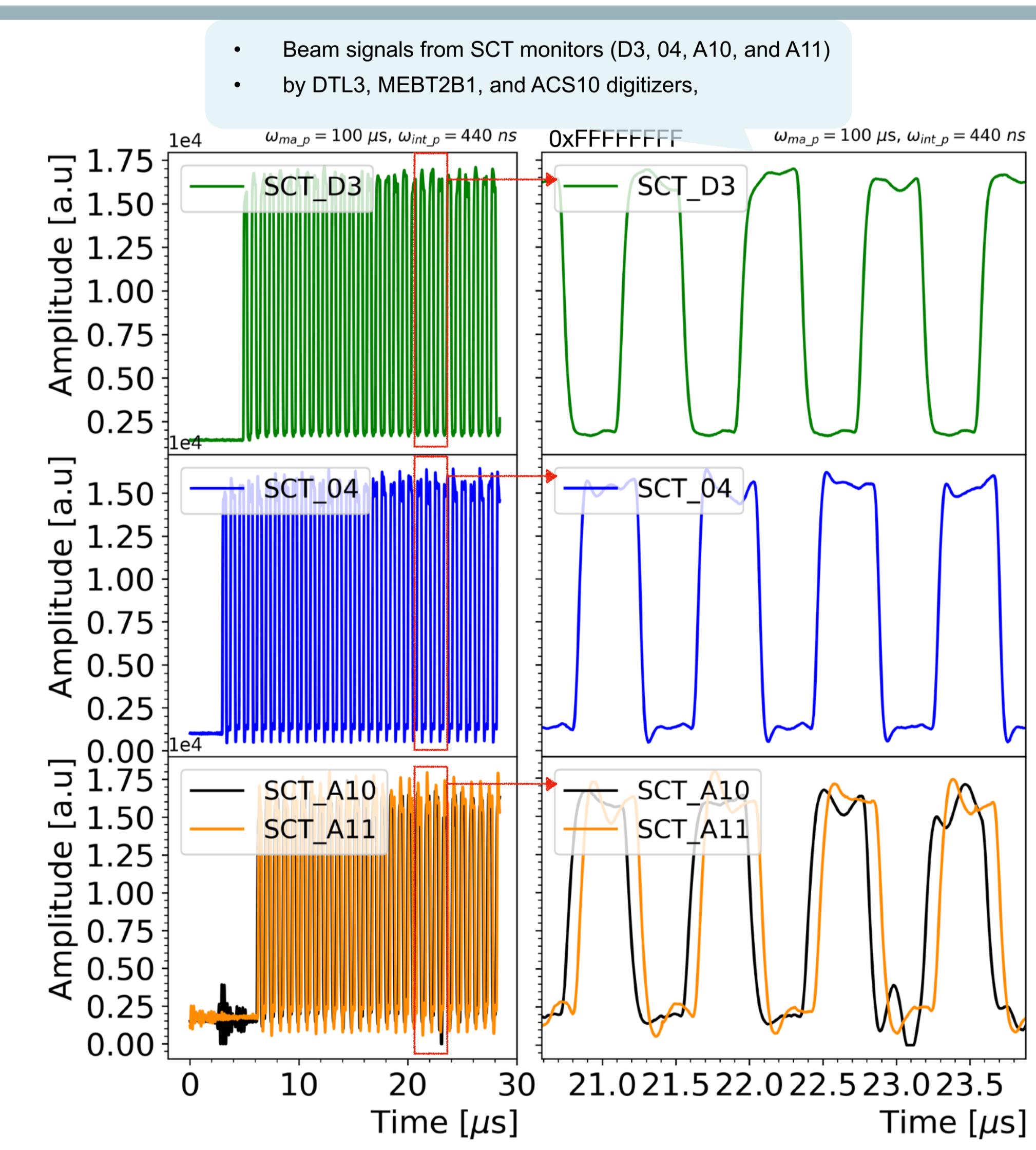
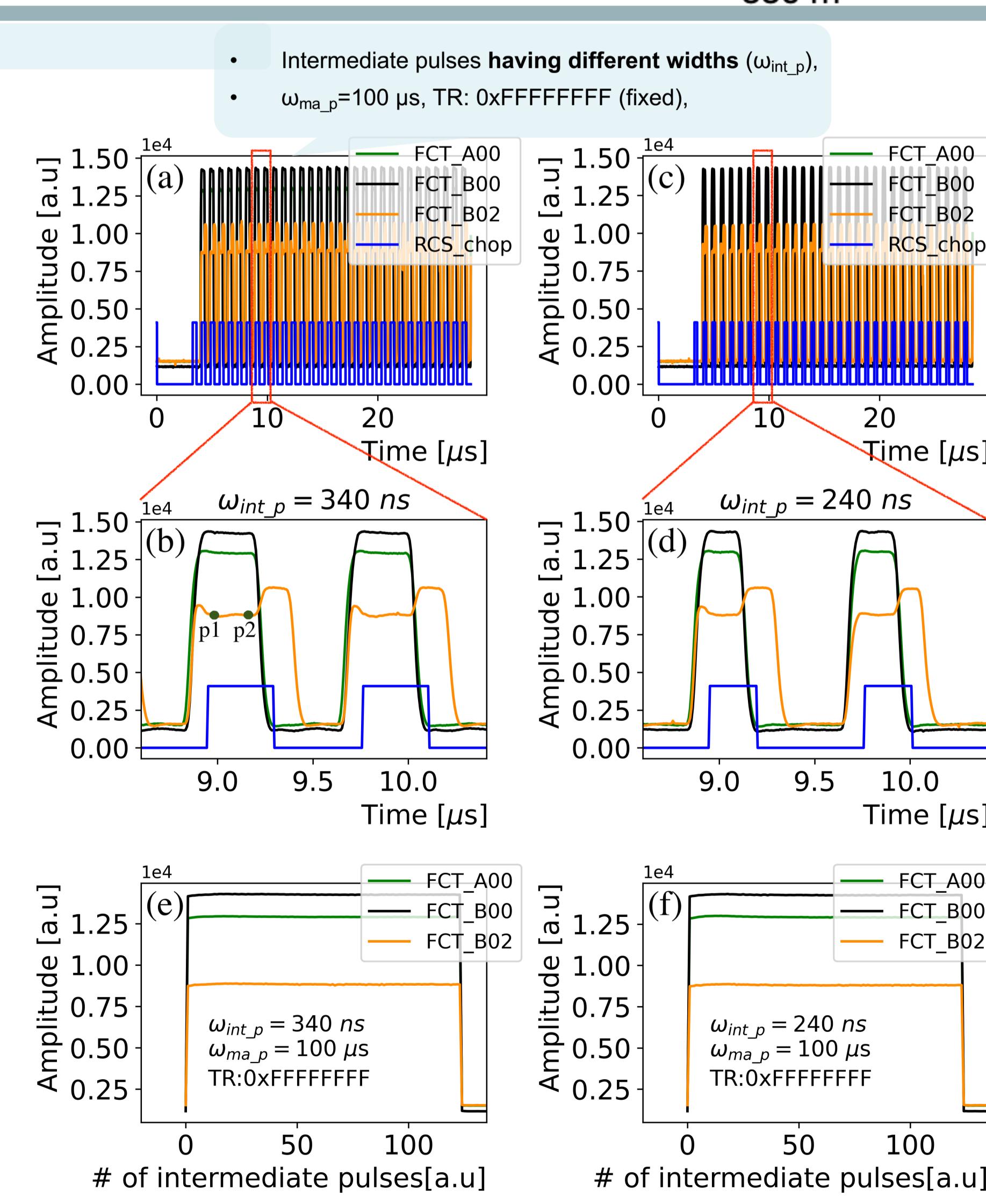
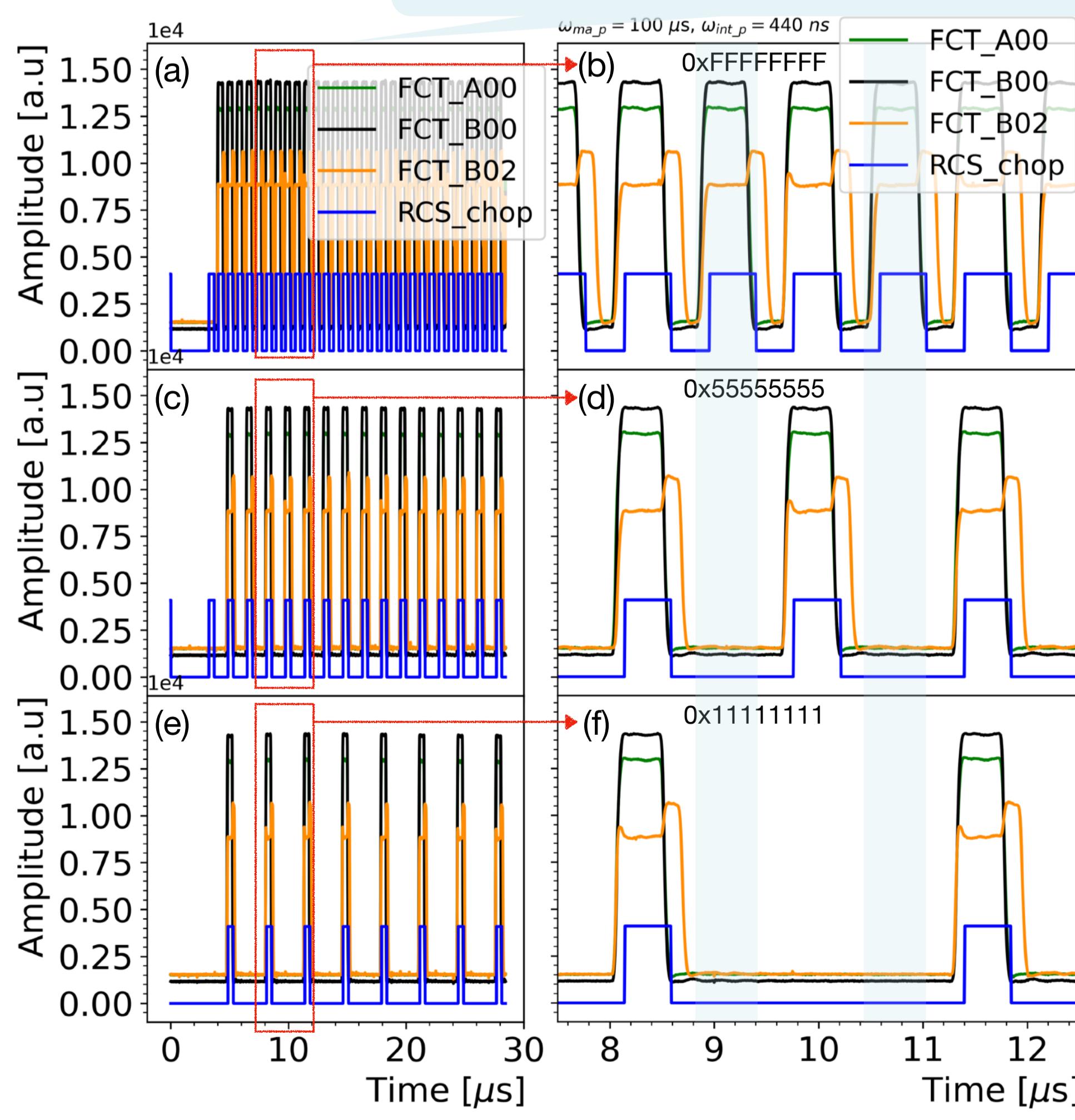


- A series of intermediate pulses with a comb-like structure synchronized with rapid cycling synchrotron (RCS) RF frequency (f_{rf}); macro-pulses by the ion source (IS), 50 to 500 μ s (ω_{ma_p}) and intermediate pulses by an RF chopper system at MEBT1.
 - The comb-like beam structure is realized by an RCS chop signal from RCS LLRF system and has different patterns in chopped-beam operation. Linac provides various pulse structures with different intermediate pulse widths (ω_{int}) and thinning rates (TRs).



Test Results

- am signals from FCT monitors, A00, B00, and B02 (@SDTL09)
ermediate pulses **with different thinning rates**



Conclusion and Future work

- Six new beam monitor digitizers were installed at six RF stations in the linac klystron gallery.
 - The new digitizers successfully measured and monitored linac beam pulse under different operating conditions.
 - Meanwhile, BPM measurements, calculations, and FPGA design development are underway.

Acknowledgments

- We gratefully acknowledge MELOS for implementing a perfect monitor digitizer for the J-PARC linac.
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