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## Novel clock and trigger solutions with ultra-high precision delay to support time-resolved experiments at TPS

*Thursday, 23 May 2024 16:00 (2 hours)*

The TPS (Taiwan Photon Source) is a third generation 3 GeV synchrotron light source. Some beamlines use synchrotron pulses in conjunction with laser pulses for pump-probe experiments, which is a time-resolved experiment method for capturing the temporal evolution of the pumped process. Periodic X-ray pulses are provided by the synchrotron light source as detecting light (Probe), and laser pulses can be used as a pump to excite a target, which changes a certain property when excited. Pump-probe experiments require a synchronized laser system to alter the delay time between X-ray pulses and laser pulses. It has been built a laser synchronizer and timing support system. One direct digital synthesizer (DDS) with fine delay adjustment can change the laser pump pulse relative to the X-ray pulse. The clock fanout buffer with output dividers provides the synchronized clocks required by the laser oscillator and laser source. An SBC (single-board computer) is employed as a control interface. The software architecture is created using the EPICS framework, which is compatible with the TPS control system, and a GUI with the ability to adjust the time delay is created. The efforts will be described in this report.

### Footnotes

### Funding Agency

### Paper preparation format

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### Region represented

Asia

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