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Using a full-sine septum power supply to study the top-up orbit disturbance at Taiwan light source

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Observation shows that the electron orbit of the TLS (Taiwan light source) storage ring was greatly disturbed during the top-up injection process, both from BPM readings and profile monitor. The distortion duration exceeds the pulse lengths of both injection kickers and septum. It was speculated that one of the possible causes would be due to the eddy current effect induced by the leak field of septum magnet. For clarification purpose, a full-sine septum power supply has been constructed and field implemented in order to eliminate the said eddy current effect. The study shows that both pulse shape matching among four kickers and septum leakage field play major influence on the causes. The experimental results will be presented in this report.

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