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Chopper-Marx Circuit for Application to ILC: 1. Switching and Voltage Adding

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A high power, long pulse modulator aimed at application to International Linear Collider (ILC) is being developed. The target parameters are: 120 kV ($\pm 0.5\%$), 140 A, 1.7 ms, and 5 pps, with consideration on compactness, reliability, and cost control. A solid state, chopper controlled pulsed power generator using Marx-topology has been proposed.

This paper concentrates on the switching management and voltage-adding performance. The whole system is made of 20 units, each of them consists of 4 Marx-circuit boards and is designed for generating an output of 6.4 kV. The key technical issues here are the high-frequency chopping for droop compensation and the phase shift for ripple cancellation. The trade-off treatment between performance and efficiency and that between compactness and circuit cooling have been carried out by optimized design.

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