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Chopper-Marx Circuit for Application to ILC: 2. Charging and System Control

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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 focuses on the charging circuit and the control methodology. Because of the high average output power, the external power supply and charging circuitry for refilling the capacitors need special consideration, especially when a high accuracy is required. A variety of issues including voltage monitoring, voltage transforming, rectifying, and isolation have been carefully considered. In addition, an operation with feedback control scenario has been designed to ensure the output that meets the ILC requirements.

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