

A SOLID STATE INDUCTION MODULATOR FOR THE NLC

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Abstract

The klystron modulators for the NLC main linac are designed to meet efficiency, reliability, maintainability and cost requirements which have not been of paramount importance for modulator accelerator applications in the past. Because of the sheer number of modulators needed in the NLC, these criteria are important. The modulator is designed to drive a load of eight klystrons. The output specifications for the modulator are to produce a 500 kV, 2120 A pulse, of 3 ms length, at 120 Hz, with rise and fall times of less than 200 ns, and overall efficiency of greater than 75 %. This is accomplished in the proto type modulator now being constructed at SLAC by using an induction linac type of transformer driven by an IGBT based switcher. The transformer consists of 76 Metglass cores stacked in twin towers. The primary of each core is driven by a 2.5 kV, 2120 A pulse through a single turn. Passing three coaxial pipes through the centers of the two towers makes the secondary. The design of the modulator will be presented here, along with problems which need to be addressed in this type of design, as well as test data.