**RF Pulse Compression via $TE_{01}$ Optically Controlled Multi-Megawatt Microwave Switch**, T.G. LEE, R.D. RUTH, S.G. TANTAWI, A.E. VLIEKS, and M. ZOLOTOREV, SLAC, CA 94309, U.S.A. - We present the design and experimental results of an optically controlled high power pulse compression system. The rf parameters of the system are chosen to fit the requirements of the X band Next Linear Collider design at SLAC. The system is based on the switched resonant delay line theory[1]. The high power microwave switch, required for this system, is realized using optical excitation of an electron-hole plasma layer on the surface of a pure silicon wafer. Previously, we showed that the power handling capability of such a switch is greatly affected by the end effects present at the interface between the silicon wafer and the supporting waveguide[2]. To avoid end effects the switch is designed to operate in the $TE_{01}$ mode in a circular waveguide. We present the theory and design of this novel type of switch, as well as the results of its experimental implementation.

1 S.G. Tantawi, et. al, "Active RF Pulse Compression Using Switched Resonant Delay Lines," accepted for publication in Nuc. Inst. and Meth, A, 1995.

2 S.G. Tantawi, et. al., "Design of a Multi-Megawatt X-Band Solid State Microwave Switch". Presented in the IEEE int. Conf. on Plasma Sci., Wisconsin, June, 1995.