

A Four Port Launcher for a Multimode DLDS Power Distribution System*, N. KROLL, UCSD** and SLAC; K. EPPLEY, Z. LI, R. MILLER, C. NANTISTA, S. TANTAWI, SLAC* - We describe a structure for launching the TE₀₁ and both polarizations of the TE₁₂ modes into a highly overmoded low loss circular waveguide providing remote transmission for a multimode Delay Line Distribution System (DLDS) [1]. The power from four sources is delivered to four structure ports by rectangular waveguide, and the mode for each pulse subsection is selected by varying the relative phases of the sources. The four ports symmetrically feed a section of waveguide with a fourfold symmetric four leaf clover like cross section, dimensioned so as to propagate only four TE modes, characterized as zero, $\pi/2$ (two polarizations), and π modes. The zero and $\pi/2$ modes are well matched, the π mode only moderately so. A low loss taper transforms the initial cross section into a circular one; the zero mode transforming to TE₀₁, the $\pi/2$ to TE₁₁, the π to TE₂₁, all with negligible mode conversion. A "sausage" type mode transducer then converts TE₁₁ to TE₁₂ (a lower loss mode), and the diameter is then expanded to the full ~five inch diameter of the delay line. A separate structure diverts power from the last pulse subsection to the local group of accelerator structures.

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[1] A Multi-Moded RF Delay Line Distribution System for the Next Linear Collider (NLC), S.G. Tantawi, et al, EPAC98 (this conference)