

Measuring Differential Group Delay and Distributed Scattering in Few Mode Fibers for Mode Division Multiplexing.

J.W. Nicholson¹, L. Grüner-Nielsen², K. Jespersen², Y. Sun³, R. Lingle³, D. Jakobsen², and B. Pálsdóttir²

1. OFS Laboratories, 19 Schoolhouse Road, Somerset, NJ 08873, USA

2. OFS, Priorparken 680, 2605 Brøndby, Denmark

3. OFS, 2000 Northeast Expressway, Norcross, GA 30071, USA

Mode division multiplexed systems in few mode fibers has attracted considerable attention as a means to increase the transmission capacity of a single fiber. The optical properties of the few-moded transmission fiber are an integral part of the performance of such communications systems. The fiber should be low attenuation, low nonlinearity and have a high dispersion coefficient. In addition the fiber should support a specific number of well guided modes, have low differential group delay between the modes and have low coupling between the modes.

Because of the importance of the DGD and mode coupling, measurement techniques to characterize the fibers are important for optimizing fiber designs for few mode transmission systems. In this talk we will present results on characterizing DGD and mode coupling in long lengths of fiber using the newly developed measurement technique, S^2 imaging. Fibers with both low and high DGD values, as well as different levels of distributed mode coupling will be presented.