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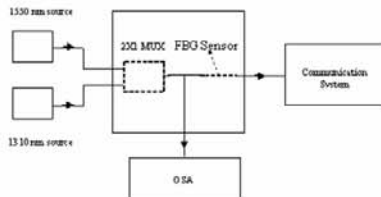
University of Delaware . Center for Composite Materials . Department of Electrical and Computer Engineering

MOTIVATION

The Aim behind the project is to make a Device which is

- Small
- Used for Sensing Applications for the Composites
- Used for Communication Applications
- Relatively Inexpensive
- More Susceptible to the Rough and Vigorous conditions

Block Schematic of the Proposed Design



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COMMERCIAL COMBINERS

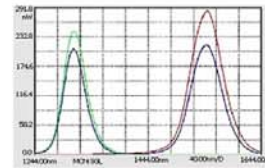
Wave Division combiner/Splitter (source: Blue Road Research)

Specifications at 20° C

- Operating Wavelength (nm): 1310/1550 ± 20
- Typical excess loss (dB): 0.01
- Max. insertion loss (dB): 0.03
- Operating temp. range (°C): -40 to 85
- Interface: FC/PC
- Dimensions (cm): 11x14x4
- BULKY**



The Performance characteristics

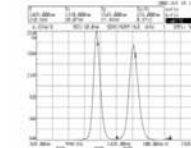


COMMERCIAL COMBINERS

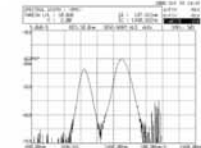
The commercially available smaller 1X2 Multiplexer (source: AOC Technology)

Specification Table

- Operating Wavelengths 1310/1550nm
- Bandwidth ±20nm
- Excess Loss (typical) 0.1 dB
- Max. Insertion Loss 0.3 dB
- Isolation => 16 dB
- Polarization Sensitivity < 0.1 dB
- Directivity => 55 dB
- Operating Temperature: -40°C to 85°C (-40°F to 149°F)
- Doesn't fall in the Range of Composites Manufacturing Temp*
- Storage Temperature: -40°C to 85°C (-40°F to 185°F)
- Fiber Specifications Coming SMF-28 (1 meter per port typical)
- Dimensions (main body) 3mm Dia x 50mm L

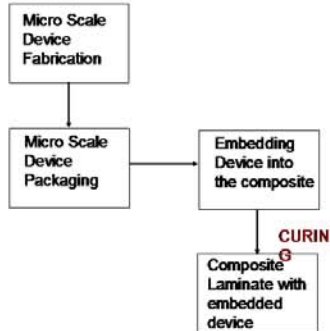


(Linear scale)

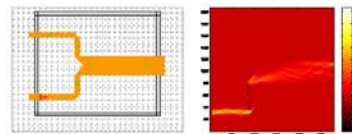


(Log scale)

DESIGN STRATEGY



SIMULATION & DESIGN



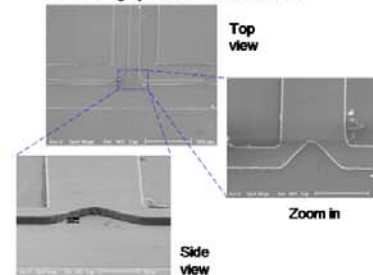
Power ratio of incident to output=95.2%



The Mask of the Designed Waveguide

SEM Micrograph

SEM Micrograph of the Laser Combiner



RESULTS & FUTURE SCOPE

