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The objective of this project was to define specifications of a hybrid integrated wavelength division multiplexed laser source, to identify the appropriate vendor, and to negotiate an acceptable price structure. In consultation with a number of user groups and the DUTRIP program at University of Maryland (PI: Prof Mario Dagenais) we have determined the set of specifications for the four wavelength WDM array.

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Final Technical Report

AFOSR Contract F49620-95-1-0535
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Monitored by Dr. Alan Craig

"WDM Laser Sources for the Defense University (Testbed) Research Internet Program (DUTRIP)"

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Final Technical Report

AFOSR Contract F49620-95-1-0535
September 30, 1995 to July 29, 1996

"WDM Laser Sources for the Defense University (Testbed) Research Internet Program (DUTRIP)"

I. Research

The objective of this project was to define specifications of a hybrid integrated wavelength division multiplexed laser source, to identify the appropriate vendor, and to negotiate an acceptable price structure.

II. Results

In consultation with a number of user groups and the DUTRIP program at University of Maryland (PI: Prof. Mario Dagenais) we have determined the following set of specifications for the four wavelength WDM array:

1) Emission wavelengths of DFB lasers:

channel 1:	1549.32 nm
channel 2:	1552.52 nm (the reference of 193.1 THz.)
channel 3:	1555.75 nm
channel 4:	1558.99 nm

All channel wavelengths to be accurate to $\pm$ 0.3 nm*

2) SMSR > 30 dB under 40 mA peak-to-peak modulation and 8.2 dB extinction ratio (SONET OC-48 spec.)

3) Threshold current ..... < 30 mA

4) External efficiency ..... >0.2 mW/mA

5) Fundamental transverse mode operation up to I_{DC} =100 mA

6) Power coupled into ..... > +6.0 dBm
single mode fiber @100 mA

7) Modulation bandwidth ..... 2.5 Gb/s **

8) Four ECL inputs to drivers: ECL, 25 Ω

9) Four single mode outputs, optical isolator in each laser package.

10) Back facet monitor in each laser package

11) Front panel setting of laser bias current and temperature for each laser.

12) Front panel indicator lights to indicate operation of each laser

* All wavelengths and spectral properties measured at a chip power output of 5 mW. The wavelength may be trimmed with a TC cooler, as long as other specs are maintained

** modulation bandwidth is limited by the driver chip.

Additional Considerations

The vendor will (a) provide available test and reliability data, and (b) establish the device code and make it available to other customers at a fixed price

These specifications were discussed with a number of vendors. Ortel Corporations was identified as a low cost supplier capable of satisfying all of the above specifications.

We have also established a testing methodology for WDM arrays. The results were presented in an SPIE paper, attached.

III. Personnel

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