

國立交通大學  
光電工程研究所

碩士論文

利用無色散の間隔器對應用在都會  
通訊網路的交換節點上

Dispersion Compensating Interleaver Pairs  
for Metro Add/Drop Applications

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中華民國九十三年六月

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2004.6.20 于風城交大

# 利用無色散の間隔器對應用在都會通訊網路的 交換節點上

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可重新配置的交換節點可以為都會網路提供更高的靈活度與通信功能;但過去均以 100%通信交換節點的置入損耗通常都高於 10dB, 因此需要更多的放大器和營運支出, 但事實上, 往往只需要提供 50%的通訊交換即可, 所以我們提出了一對無色散の間隔器作為新的網路架構。

在本論文裡, 先研究間隔器的數學模擬和色散補償的過程, 並將理想的數學模型建構在商用的系統軟體平台上, 進而分析在理想的狀態下, 50%的通訊交換對於短距傳輸系統的優劣和高速資料傳輸(40-Gb/s)實現性; 也提供將來將更複雜的模型導入和做為日後實驗參數與結果預測的重要參考依據。

# Dispersion Compensating Interleaver Pairs for Metro Add/Drop Applications

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## ABSTRACT

Reconfigurable add/drop nodes will enhance metro network flexibility and be able to provide the much needed functionalities. However, due to the high insertion loss of the add/drop engine (typically  $>10\text{dB}$ ), 100% traffic add/drop nodes need more optical amplifiers and operational expenditure in the transmission systems. In fact, it is good enough to provide adequate 50% traffic add/drop capability in the recent network. Therefore, we create the novel network structure by using the dispersion-free interleaver pairs.

In this thesis, we set up an ideal metro network by the new interleaver module on the commercial simulated platform. By implementing the virtual network, we demonstrate the impacts on system performance and predict the transmission possibility for the 40-Gb/s DWDM system. The architecture can also be easily modified to more complex model and will provide the important predicts of the parameters and results in the future experiment.

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