环形全光WDM网络的波长分配

李国君(1)，张少强(1)，Ousmane Samake(1)，陈光亭(2)

(1)山东大学数学与系统科学学院,济南250100;(2)杭州电子工业学院文理学院,杭州310012

摘要　　我们考虑的问题来自于基于波分复用技术(WDM)的全光环形网络,给定环形网络中一个路(通讯请求)的集合,将每一条路分配一个波长,使得经过相同连接的路必须分配不同的波长,
我们的目标就是找一个波长分配方案使所需的波长数目最小,令ω表示为路集中最大两两相交路的个数,
本文我们设计了一个可以保证指派到路集的波长数目不超过
1.5ω的近似算法。因为ω是路集所需波长最小数目的一个下界，所以该算法的近似比不超过1.5。

关键词　　波长分配,近似算法,环形图,WDM网络

分类号

WAVELENGTH ASSIGNMENT IN ALL-OPTICAL WDM NETWORKS WITH RING TOPOLOGY

Guo Jun LI(1),Shao Qiang ZHANF(1),OUSMANE SAMAKE(1),Guang Ting CHEN(2)

(1)School of Mathematics and Systems Science, Shandong University, Ji'nan 250100,P.R.China;(2) School of Science and Arts,Hangzhou University of Electronic Science and Technology，Hangzhou 310012,P.R.China

Abstract The problem we consider arises in an all-optical communications network with wavelength division multiplexing (WDM) configured as a ring. Given a set of paths (requests) over a ring, wavelengths must be assigned to the corresponding paths such that paths that use the same link are assignde different wanelengths. The goal is to minimize the number of required wanelengths.In this article,we design an approximation algorithm that assure the number of wabelengths assignde into the set of paths is no more than 1.5ω,where ω is the cardinality of the maximum ser of pairwise intersecting paths.Since ω is a lower bound of the minimun possible number of wavelengths for the set of paths,the algorithm guarantees that the performance ratio is no more than 1.5.

Key words　Wavelength assignment　approximation algorithm　ring　WDM networks

通讯作者