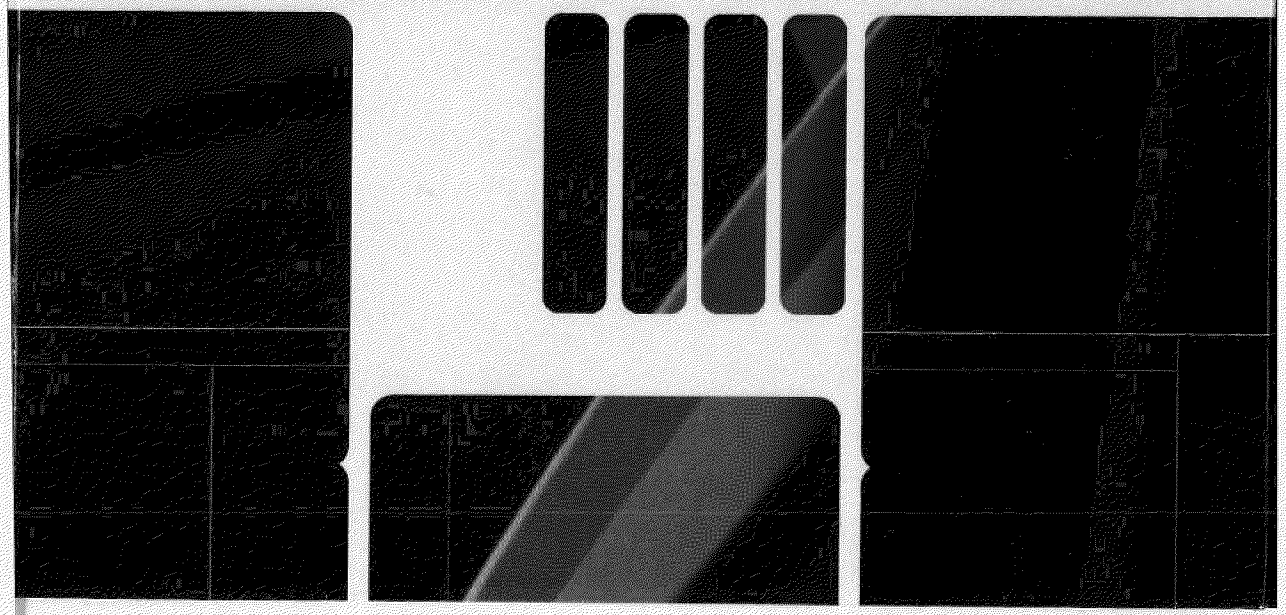
EXHIBIT J

Shing-Fong Su

The UMTS Air-Interface in RF Engineering

Design & Operation of UMTS Networks



The UMTS Air-Interface in RF Engineering: Design and Operation of UMTS Networks

Shing-Fong Su, Ph.D.

Distinguished Member of Technical Staff, Alcatel-Lucent

New York Chicago San Francisco Lisbon London Madrid
Mexico City Milan New Delhi San Juan Seoul
Singapore Sydney Toronto

The McGraw-Hill Companies

Library of Congress Cataloging-in-Publication Data

Su, Shing-Fong.
The UMTS air-interface in RF engineering / Shing-Fong Su.
p. cm.
ISBN 0-07-148866-9 (alk. paper)
1. Radio circuits--Design and construction. 2. Radio frequency. I. Title.
TK6560.S87 2007
621.384'12--dc22

2007008339

The UMTS Air-Interface in RF Engineering:
Design and Operation of UMTS Networks

1234567890 DOC/DOC 01987

ISBN-13: 978-0-07-148866-2
ISBN-10: 0-07-148866-9

Sponsoring Editor
Steve Chapman

Editorial Supervisor
Jody McKenzie

Project Manager
Vastavikta Sharma

Acquisitions Coordinator
Katie Andersen

Copy Editor
Julie M. Smith

Proofreader
Bev Weiler

Indexer
Shing-Fong Su

Production Supervisor
George Anderson

Composition
International Typesetting and Composition

Illustration
International Typesetting and Composition

before decoding the data packet. This method wastes more bandwidth than the incremental redundancy method, since the entire error packet must be retransmitted.

Incremental redundancy correctly selects the transmitted bits from both the original transmission and the retransmission, in order to minimize the need for further repeat requests. This method is used to get maximum performance out of the available bandwidth. In incremental redundancy, the retransmitted block consists of only the correction bits for the original data packet. The additional redundant bits are sent incrementally when the first, second, third, and so forth retransmissions are received with errors.

11.1.5 Code Allocation and Code Multiplexing of Packet Transmissions

HSDPA uses a fixed spreading factor of 16. Within each 2-ms TTI, a maximum of 15 consecutive OVSF codes can be allocated to 15 parallel HS-PDSCH channels for the HS-DSCH. These channels may all be assigned to one user during the TTI, or may be split among several HSDPA users. In other words, it is possible to schedule transmissions to a single UE or to multiple UEs at the same time. It can also transmit to a small number of UEs with good channel quality. In essence, the transmission can be time division multiplexing (single user in one TTI) or code division multiplexing (multiple users in one TTI). Figure 11.3 illustrates an example of the sharing of HS-PDSCHs among users.

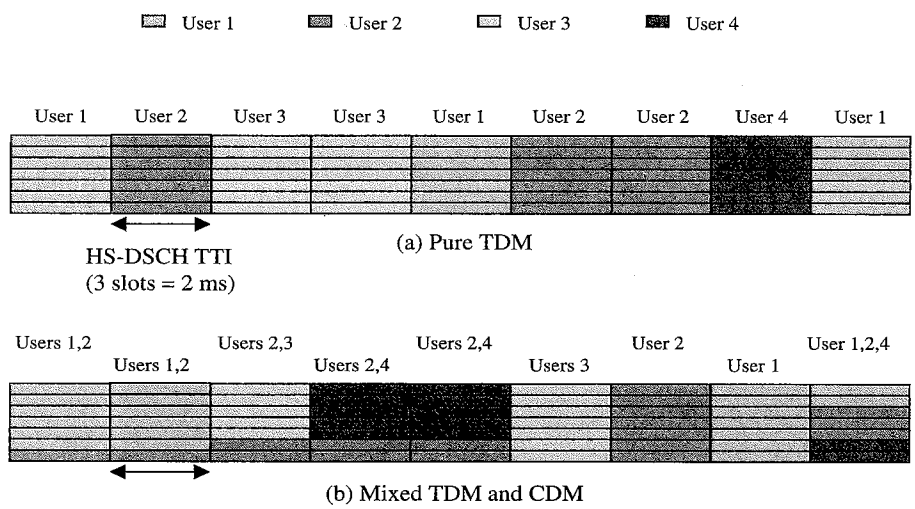


Figure 11.3 Sharing of HS-PDSCHs among users (a) Pure time division multiplexing (b) Mixed time division multiplexing and code division multiplexing.