The electronic band structures of single isolated tubes and nanotube bundles are presented in Chapter 3. The optical and transport properties of carbon nanotubes are treated in Chapters 4 and 5 on the basis of electronic band structure in the optical range and near the Fermi level. The elastic property of nanotubes is introduced in Chapter 6. The basic concept of Raman scattering is briefly covered in Chapter 7 followed by more detailed treatment on the dynamical properties of carbon nanotubes in Chapter 8. This chapter covers carbon atom vibrations and the effect to the electronic band structure through single and double resonances. There are three appendices, an extensive bibliography with 26 pages of references, and an index at the end of the book.

This book gives a very nice introduction to the basic principles of carbon nanotubes. Yet there is much to be studied about the structure of carbon nanotube. For example, there is no satisfactory explanation of why the property of bulk carbon nano tubes is so different from that of isolated carbon nanotubes described above. The microscopic structures of some metallic tubes and other semiconducting tubes are very close in their unit cell structures with only slight differences in charality [1].

The study of carbon nanotube is of fundamental importance to solid-state physics and is vital for the development of nanotechnology. This book is therefore of interest to a wide range of scientists and graduate students in material science.

Reference

[1] "Charality dependency of the thermal conductivity of carbon nanotubes," *Nanotechnol.,* vol. 15, pp. 936–939, 2004.

MICROWAVE RING CIRCUITS AND RELATED STRUCTURES

By Kai Chang and Lung-Hwa Hsieh, Wiley-Interscience, 2004.

The book covers the modeling and application of ring circuits. The first few chapters explain the structures and modeling techniques for each of the ring resonators. The authors also detail more complex phenomena such as resonant modes. The applications of the ring structures can range from filters to couplers, antennas, and mixers. Chapters are devoted to explaining the application of each function in detail.

There are many modeling techniques for the ring structure. Simpler methods like the magnetic wall model and more detailed ones such as the transmission line model are described. The pros and cons of each modeling techniqus are described. Techniques to make resonance frequency tunable are shown.

The main point of the book might be the explanation of the application of the ring structure. Depending on the ports of the ring, the ring can be used as a coupler or mixer. The reader can learn how to use ring structure to build a mixer and the electrical parameters that could be impacted by adjusting the physical parameters of the ring. Also, the book details the filter built using ring structure. It addresses how to make sharper rejection and wider bandwidth. The filter parameters can be tuned as well using stubs. Ring structure can also be used to measure the permittivity and permeability.

Ring structure antennas are also described. Modeling the structure and frequency selection using bias are shown. Reflectarrays using ring resonators are also shown.

One of the outstanding characteristics of the book is the description of the application using rings. The reader will not only know the basic operation and theoretical equations but also understand how are they applied. Yet, the book is more suitable for those very knowledgeable in microwave theory.

THE DESIGN OF CMOS RADIO-FREQUENCY INTEGRATED CIRCUITS, 2ND EDITION

By Thomas Lee, Cambridge University Press, 2003.

All-CMOS radio transceivers and systems-on-a-chip are rapidly making inroads into a wireless market that for years was dominated by bipolar solutions. Especially on wireless LAN and Bluethooth RF, CMOS is dominant, and it is also becoming dominant in GSM cellular and GPS receivers. Hence, books that cover this widespread domain are particularly timely and useful.

The first edition of the text, published in 1998, was a pioneer textbook in the field of RF CMOS design. This second edition is an upgraded version that includes new material and several revised topics. In particular, it now includes a chapter on the fundamentals of wireless systems. The chapter on IC components is highly expanded and follows the chapter on passive RLC components. The chapter on MOS devices has been updated to include the understanding of the model for the short-channel MOS and considers and discusses the scaling trends and impact over the next several years. The topic of power amplifiers has been expanded to cover techniques for linearization and efficiency enhancement. Low-noise amplifiers, oscillators, and phase noise are expanded and treated with more detail. The chapter on transceiver architectures includes many more details, especially on direct conversion architecture. Additional commentary on practical details of simulations, floor-planning, and packaging has been added.

Since its first edition, the book widely covered all the main arguments needed in the CMOS design context and provided a bridge between system and circuit issues. This upgraded second edition is useful both in the industry and academia for the new generation of RF engineers. It is suited for students taking courses on RF design and is a valuable reference for practicing engineers. The arguments treated in the textbook follow up on low-frequency analog design IC topics. Hence, readers must be intimately familiar with that subject.

The book is divided into 20 chapters. It contains hundreds of circuit diagrams and many homework problems.

Gaetano Palumbo

MOBILE WIRELESS COMMUNICATION

By M. Schwartz, Cambridge University Press, 2005.

This book gives an introductory survey of the basic principles of mobile wireless communication, including

8755-3996/06/$20.00 ©2006 IEEE