References for Low-Temperature Plasmas

Wei Tian

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This reference list is made for those who want to learn the physics, modelling and simulation of low-temperature plasmas. Books and papers are given with my comments which serve as a brief guidance. The list will be updated occasionally.

Part I

Books for Physics of Plasmas

1 "Principles of Plasma Discharges and Materials Processing", M. Lieberman

Classic textbook for college courses. It is a must-have book and one of the most practical and comprehensive resources for anyone whose work is related to low-temperature plasmas.

2 "Plasma Physics and Engineering", A. Friedman and L. A. Kennedy

Comprehensive text on low temperature plasmas. This book provides the basic plasma physics and engineering, just like what the title says, to an experiened engineers or scientists outside the plasma field.

3 "Plasma Chemistry", A. Fridman

Physics of low temperature plasmas and application to gas phase and surface chemistry.

4 "Physics of Radio Frequency Plasmas", P. Chabert and N. Braithwaite

Recent monograph on RF discharges of the type used for plasma materials processing. The focus of this book on RF plasmas is particularly good for those who work in semiconductor industry.

5 "Industrial Plasma Engineering" Vol 1 & 2, P. R. Roth

Practical view of low temperature plasma physics from an engineering perspective.

6 "Plasma Physics via Computer Simulation", C. K. Birdsall and A. B. Langdon

Introductory text on the use of Particle-in-Cell simulations for modeling plasmas. It is the classic and must-have book if you are doing PIC simulation. But the code presented in the book is sort of outdated.

7 "Partially Ionized Gases", M. Mitchner

Mostly for fully ionized plasmas but good treatment of sheaths, continuity equations, and electron-ion collisions.

8 "Basic Data of Plasma Physics", S. C. Brown

Classic but dated text for basic topics.

9 "Introduction to Plasma Physics and Controlled Fusion", F. F. Chen

As stated in the title, it is the textbook for those who work in fusion, where plasma is in high temperature. The introduction section is friendly for beginners. It describes fully ionized plasmas with good treatment of Debye lengths, and magnetic field effects.

Part II
Papers for Modeling and Simulaiton of Plasmas

10 "Foundations of modelling of nonequilibrium low-temperature plasmas", L. L. Alves, A. Bogaerts, V. Guerra and M. M. Turner

Overview of PIC, kinetic and fluid model of plasma discharge. The authors introduced each model in a small section and provided a big picture of plasma modeling and simulation.

11 "Modelling Methods for Low-Temperature Plasmas", G. Hagelaar

Good overview of plasma fluid model with numerical methods.

12 "Simulation of a large size ICP with comparison to Exp", F. Lei, et al

Good introduction of numerically solving field equation in an ICP.

13 "Fluid model of inductively coupled plasma etcher based on COMSOL", Cheng Jia, et al

Brief description of equations needed for plasma fluid model.

14 "Ion Energy Distributions in Collisionless and Collisional, Capacitive RF Sheath" - thesis by Ying Wang

Comprehensive overview of sheath model in CCP RF sheath.

15 "Ion energy distributions in rf sheaths review analysis and simulation", E.Kawamura, et al

Analytic analysis and simulation of RF sheath.

16 "Nano-Scale Feature Profile Modeling of Plasma Material Processing" - thesis by C. Huard

Comprehensive overview of Monte Carlo feature model (MCFPM). The author Dr. Huard graduated from Prof. Kushner's group in University of Michigan.