Acknowledgment

Laudation to the God of majesty and glory! Obedience to him is a cause of approach and gratitude in increase of benefits. Every inhalation of the breath prolongs life and every expiration of it gladdens our nature; therefore every breath confers two benefits and for every benefit gratitude is due.

The thesis is coming towards the end, with imprints of many unforgettable memories. During this period, many people have contributed directly and indirectly for my Ph.D. work and this thesis is incomplete without acknowledging them.

I would like to express my deep sense of gratitude to my guide Prof. S.D. Dhole, Department of Physics, University of Pune, for his able guidance not only as a teacher but also as a researcher and his incessant encouragement. The co-operation extended by him towards me during all phases of my research work as well as personal life is gratefully acknowledged. Without him, it would not have been possible to complete this Ph.D. work.

It is my utmost pleasure to express my deep sense of heartfelt gratitude towards Prof. V.N. Bhoraskar. I am very fortunate and proud to have worked under his guidance.

I am also thankful to our former head of the Department, Prof. P.B. Vidyasagar and present head, Prof. S.I. Patil for kindly extending all departmental facilities during my Ph.D work.

It is my utmost pleasure to express my gratitude towards Prof. M. Ghoranneviss, director of the Plasma Physics Research Center, Science and Research Branch, I.A.U, Tehran, Iran, for all his cordial support and precious endeavors for me in order to possess the chance of studying my Ph.D. in the Department of Physics, University of Pune, India.

I am thankful to Dr. Bhushan Patil, who helped me. I have a great pleasure in extending my sincere thanks to my lab-mates, Avinash Deore, Nandkumar Mandlik, Dr. Kailash Sapnar, Dr. Vinod Kulkarni, Vijay Jadhav, Vikas Mulik, Shahzaad Akhtar
and Mahesh Bhadane and also Avinash Bansore for their help, kind co-operation and many more, the time we shared and the joy we had together during all these years.

I would like to express gratitude towards all the non teaching staff of the Department of Physics, University of Pune, Pune.

I also wish to express my deep sense of gratitude towards my lovely wife Saviz and my nice parents Shakour and Tahereh for their moral support and constant encouragement at all stages, during the research work.

Mehdi Salehi Barough
July, 2013
Pune, Maharashtra, India