

エム・アビッド・イムティアツさん / 静岡大学
Dr. Imtiaz M Abid / Shizuoka University

<外国人研究者プロフィール Profile>

国籍: Nationality:	バングラデシュ / Bangladesh
日本留学時の滞在期間: Period of Stay During in Japan:	2010年 5月31日 ~ 2010年 8月28日 May 31, 2010 ~ Aug 28, 2010
日本留学時の大学: Education Background in Japan:	静岡大学 / Shizuoka University
専攻分野: Major Field:	物理学 / Plasma Physics
現在の所属/職位: Present Institution / Status:	バングラデシュ原子力研究所・エネルギー部門、研究員 Energy Institute, Bangladesh Atomic Energy Commission / Senior Scientific Officer



エム・アビッド・イムティア
ツさん
Dr. Imtiaz M Abid

<研究報告 Follow up Research Fellowship>

受入研究者氏名: Research Adviser:	三重野 哲教授 / Prof. Testu Mieno
受入れ期間: Researching Period:	2010年5月31日~2010年8月28日 May 31, 2010 ~ Aug 28, 2010
研究課題: Theme of Research:	磁化SF6 プラズマを用いた高密度負イオン発生の研究 Higher-Density Negative-Ion Production Using Magnetized SF6 Plasma

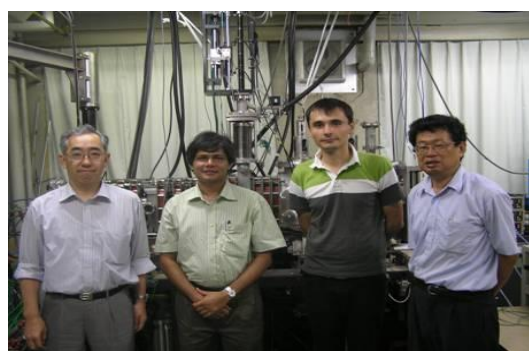
■研究概要 Outline of Reserch

Negative-ion plasmas have a big potential to improve production of high-quality LSIs in the high-tech industries by reducing notching effects during Si-etching. To realize the ultra-fine etching in LSI fabrications, a higher-density and stable negative-ion source is necessary. In a magnetized plasma column generated from an electronegative gas, it is known that negative ions accumulate around the plasma column via radial diffusion. In this study, dc discharge is applied in SF6 gas to produce a plasma column with B= 0.03 tesla. The Langmuir probe method is applied for the diagnosis of the plasma produced in a metal chamber. Gas pressure and discharge current dependences of n- are observed. The radial density profiles are compared with those of CF4. Negative-ion density is calculated using the modified Bohm criterion. It is found that at p= 0.13 Pa n-, in SF6 plasma is ~ 8x10¹⁷ m⁻³, and in CF4 plasma, n- ~ 3x10¹⁷ m⁻³. This ion-ion plasma has n-/ne range from 100 to 900, and is attractive for applications.



静岡大学におけるプラズマ法に寄る炭素膜合成実験
Carbon-film coating experiment at Shizuoka Univ

■研究成果 Result of Reseach



東海大学理学部利根川研究室訪問
(利根川教授(左)と)
With Prof. Akira Tonegawa (left) in his laboratory in Tokai University

The negative-ion density profiles across the magnetic filed are measured in SF6 plasma at various experimental condition, where the major species is F-. The modified Bohm condition is utilized for the calculation of n-. It is found that at p= 0.13 Pa, n- in SF6 plasma is ~ 8x10¹⁷ m⁻³. In this ion-ion plasma n-/ne has a range from 100 to 900, which is attractive for applications.

■日本留学の思い出 Memories of Studying in Japan

It is a matter of great pleasure and honor for me to have awarded Follow-up Research Fellowship by the JASSO. This fellowship has given me a great opportunity to carry out some new researches in Japan as well visit some very attractive spots and universities in Japan.



富士山公園へのドライブ(紅葉台にて)
Trip to Mt. Fuji area (at Koyo-dai)



富士山近く、陣馬の滝にて
In front of a water fall near Mt. Fuji
(at Jinba no taki)

Besides carrying out some new researches in Shizuoka University, during my 90-day stay in Japan, I took part in a one-day long summer school in Nagoya University on 10 August 2010, and visited Prof. Akira Tonegawa and his research facilities in Tokai University in Kanagawa. Other than these academic trips, Professor Tetsu Mieno, my research supervisor in Shizuoka University arranged some enormous pleasure-trips to the beautiful lakes of Mt Fuji, Fuji caves, Hakone etc.

I, along with the other lab-mates enjoyed the trips so much. These trips enriched and sharpened my already very good memory and experience about Japan. Nonetheless, in Summer, evening sky of Japan becomes so colorful because of the events of `hanabi`. I loved to see the mood and color of the crowd in the occasion of hanabi. I myself enjoyed Abekawa hanabi in Shizuoka with mindful of joy and pleasure. All these memory-mix during my 90-day stay really makes me feel so happy.



箱根公園箱根山頂上にて、三重野教授と共に
With Prof. Tetsu Mieno in a trip to Hakone
(at Hakone-yama)