



# DEPARTMENT OF PHYSICS

UTKAL UNIVERSITY  
BHUBANESWAR—751004, INDIA

VANIVIHAR PBX  
52520—EX-57

Date..... 11.10.80.....

To

Dr. R.K. Verma  
Plasma Physics Group.  
Physical Research Laboratory.  
Ahmedabad- 380009

Dear Dr. Verma,

This is Chitra Sen from the Utkal University, Bhubaneswar. I am very much interested in attending the Spring College on Fusion Studies, to be held in Miramare, Trieste, during May 26-June 19, 1981, of which you are a member of the Advisory Committee. I have already applied at the Trieste address. I am sending herewith a copy of the application and a copy of the abstract of a paper, I intend to present in the Symposium ( May 26 -June 1, 1981) to you, and request you to kindly forward them to the proper place.

Thanking you very much,

Sincerely yours,

*Chitra Sen*

( Chitra Sen )

NON-NEUTRAL BEHAVIOUR OF A M.P.D. AT LOW PRESSURES.

C. Sen,  
Physics Department,  
Utkal University, Bhubaneswar-4, India.

The ions in a mirror confined plasma suffer an enhanced end loss due to electrostatic effects. In a modified Penning discharge ( M.P.D.) an electrode at the midplane of the mirror, biased with high positive potential serves as the anode of the discharge. Due to the presence of this midplane electrode, a sheath-like structure, resembling a projection of the anode sheath along the magnetic field lines is observed at the mirror throat at low pressures. This results in a steep down hill potential at the cathode ( Super-conducting magnet dewar ) side. The ions, due to their large gyroradii and due to this steep down hill potential are lost quite readily at the cathodes, thus leaving the plasma richer in electrons and hence non-neutral. The electrons remain tightly bound ~~bound~~ to the lines of force.

A theory of non-neutral plasma extended towards the case of a M.P.D. seems to explain the experimental observations on mode transitions, axial electric field, rotational frequency of the charged particles and the appearance of the hollow plasma column etc. qualitatively at low pressures.

9. 10.80

To

The Advisory Committee.  
Spring College on Fusion Studies.  
International Centre for Theoretical Physics.  
P.O.Box-586, I-34001  
Trieste, Italy.

Dear Sirs,

This is Chitra Sen from the Physics Dept. Utkal University, Bhubaneswar, India. I am a Plasma experimentalist. I did my Ph.D. on Plasma Diagnostics in 1973 from S.J.N.P., Calcutta. As a post doctoral research associate I joined the NASA Lewis Research Centre, Cleveland, Ohio and was associated with the Bumpy Torus Project. (1976-1977).

I am very much interested in attending the Spring College on Fusion Studies to be held in Miramare, Trieste, Italy during May 26-June 19, 1981. Also, I would like to present a paper in the Symposium on Plasma Research. Theory and experiment ( May 26-June 1, 1981). The title of the paper is ' Non-neutral behaviour of a Modified Penning Discharge at low Pressures', and I am sending an abstract of the same alongwith this letter.

I would also request you to support me financially ( T.A.+D.A.) as my home Institution would not be able to help me in this matter.

Thanking you very much.

Sincerely yours,

*Chitra Sen*  
( Chitra Sen )