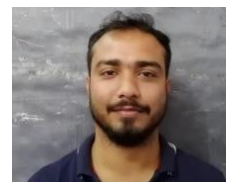


DARPAN BHATTACHARJEE



Details

- › Date of Birth: 03/10/1991
- › Address of Correspondence: CPP-IPR, Nazirakhat, Sonapur, Kamrup(M), Assam, 782402
- › Permanent Address: Sukatiالي, P.O.: Nagagaon, District: Sivasagar, Assam – 785701
- › E mail ID: darpanb95@gmail.com; darpan.bhattacharjee@cippi.res.in
- › Phone no: 8474883721

Skills

- › Expertise in plasma characterization, basic plasma experiments and simulations, construction and handling of plasma diagnostic tools, neutron, and x-ray physics.
- › Computer skills: Linux/Windows; MatLab, LaTeX, computer simulations, etc.
- › Verbal and writing communications.

Language Known

- › English, Assamese, Hindi

Educational Qualification

EXAMINATION	YEAR OF PASSING	BOARD/UNIVERSITY	PERCENTAGE
H.S.L.C.	2007	SEBA	71.8
H.S.S.L.C.	2009	AHSEC	68.6
B.Sc. (Physics)	2013	DIBRUGARH UNIVERSITY	75.4
M.Sc. (Physics)	2015	COTTON UNIVERSITY	84.5
Ph.D. (Physics)	2023	GAUHATI UNIVERSITY	

Distinctions

- › Qualified SET in 2018 (subject: Physical science).

Research Experience

2016- 2023 **Research Scholar**

During my Ph.D. tenure, I focused on the study of plasma particle dynamics in a cylindrical IECF device. Special emphasis has been given to the study of ion re-circulation characteristics, potential well, and ion density profiles during high voltage continuous mode of operations. Different self-constructed plasma diagnostic tools have been used to measure plasma parameters and properties. Simulation work using an object-oriented particle-in-cell (OOPIC) code has also been carried out in order to validate the experimental results. I have also performed the optimization of the geometrical configuration of the device to maximize the neutron (which is the basic product of deuterium-deuterium fusion) production rate. The emitted neutrons have been successfully utilized in the detection of explosive material which is one of the vital applications of the device. Lastly, I have produced continuous X-rays from the device by employing both negative and positive polarity of the central electrode and utilized the emitted x-rays to obtain the radiography images of metallic as well as biological samples. During my research work, I have gained experience operating different equipment such as different plasma diagnostic tools, high voltage DC power supplies, vacuum pumps, pressure gauges, neutron and x-ray detectors, etc.

Research Publications

- ▶ **D. Bhattacharjee**, D. Jigdung, N. Buzarbaruah, S. R. Mohanty, and H. Bailung; *Studies on virtual electrode and ion sheath characteristics in a cylindrical inertial electrostatic confinement fusion device*, **Physics of Plasmas**, **26(7):073514**, 2019
- ▶ **D. Bhattacharjee**, N. Buzarbaruah, S. R. Mohanty, and S. Adhikari; *Kinetic characteristics of ions in an inertial electrostatic confinement device*, **Physical Review E**, **102(6):063205**, 2020.
- ▶ **D. Bhattacharjee**, N. Buzarbaruah, and S. R. Mohanty; *Neutron and x-ray emission from a cylindrical inertial electrostatic confinement fusion device and their applications*, **Journal of Applied Physics**, **130(5):053302**, 2021
- ▶ S. Kalita, **D. Bhattacharjee**, and S. R. Mohanty; *Development of a compact pulse power driver for operation of table-top fusion device*, **European Physical Journal D**, **76:21**, 2022.
- ▶ L. Saikia, **D. Bhattacharjee**, S. R. Mohanty, and S. Adhikari; *Studies on ion flow dynamics in a disk-shaped inertial electrostatic confinement fusion Device under the influence of triple grid arrangement*, **Physics of Plasmas**, **30:022110**, 2023
- ▶ **D. Bhattacharjee**, S. R. Mohanty, and S. Adhikari; *Effect of positive polarity in an inertial electrostatic confinement fusion device: electron confinement, x-ray production and radiography*, Accepted in **Fusion Science and Technology**

Conference Proceedings

- ▶ **D. Bhattacharjee**, N. Buzarbaruah, S. Kalita, and S. R. Mohanty; *Study on ion dynamics in an inertial electrostatic confinement fusion device*, **6th PSSI Plasma Scholars Colloquium (PSC-2018)**, SMIT, Sikkim, ISBN: **978-93-86947-68-0**
- ▶ **D. Bhattacharjee**, S. Adhikari, N. Buzarbaruah, and S. R. Mohanty; *Study on ion re-circulation and potential well structure in an inertial electrostatic confinement fusion device using 2D-3V PIC simulation*, **8th PSSI Plasma Scholars Colloquium (PSC-2020)**, KIIT, Odisha, **E-proceedings**.
- ▶ S. R. Mohanty, N. Buzarbaruah, **D. Bhattacharjee**, and D. Jigdung; *Basics of inertial electrostatic confinement fusion and its applications*, **AIP Conference Proceedings**, **2319, 030012** (2021).

Conference Attended

- ▶ Poster presentation in 6th PSSI Plasma Scholars Colloquium (PSC), SMIT, Sikkim, 'Study on ion dynamics in an inertial electrostatic confinement fusion device', 24 – 26 August 2018.
- ▶ Poster presentation in 33rd National Symposium on Plasma Science and Technology (PLASMA-2018), Delhi University, 'Ion dynamics study in an inertial electrostatic confinement fusion device and its application in explosive detection', 4 – 7 December 2018.
- ▶ Poster presentation in National Conference on Green, Sustainable and Evolving Sciences (GSES-2019), Cotton University, 'Study on ion dynamics in an inertial electrostatic confinement fusion device', 28 – 29 June 2019.
- ▶ Oral presentation in 34th National Symposium on Plasma Science and Technology (PLASMA-2019), VIT, Chennai, 'PIC simulation of ion dynamics in an inertial electrostatic confinement fusion device', 3 – 6 December 2019.
- ▶ Oral presentation in 8th PSSI Plasma Scholars Colloquium (PSC-2020), KIIT, Odisha, 'Study on ion re-circulation and potential well structure in an inertial electrostatic confinement fusion device using 2D-3V PIC simulation', 8–9 October 2020.
- ▶ Oral presentation in National Conference on Emerging Trends in Physics (NCETP-2021), Tezpur University, Assam, 'Particle-in-cell simulation of plasma species in an inertial electrostatic confinement fusion device at high voltage operation', 16 June 2021.
- ▶ Oral presentation in International Conference on Advances in Physics and its Applications (APA-2021), Duliagan College, Assam, 'A table-top neutron/x-ray source for near-term applications', 26 – 27 November 2021
- ▶ Oral presentation in 36th National Symposium on Plasma Science and Technology (PLASMA-2021), BIT, Jaipur, 'Utilization of an inertial electrostatic confinement fusion device as a neutron and x-ray source', 13 – 15 December 2021.

Workshop Attended

- ▶ DST-SERB School on Plasma Theory, held at Institute of Advanced Study in Science and Technology (IASST), Guwahati, 9 – 29 November 2016.

Award Received

- ▶ Best poster award at National Conference on Green, Sustainable and Evolving Sciences (GSES-2019), Cotton University, on "Parametric Studies on Ion Dynamics in an Inertial Electrostatic Confinement Fusion Device".
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