

CURRICULUM VITAE

PERSONAL INFORMATION:

Name: Xinhang Xu

Date of Birth: Jun. 11th, 1993

Education qualification: Bachelor in Department of Applied Physics

Address: 96 Jinzhai Ave. Hefei city, Anhui province, China, 230026

Phone: (86)18356521726

Email: xuxh@mail.ustc.edu.cn

EDUCATION:

University of Science and Technology of China (USTC), Hefei, China

Ph.D. candidate in College of Physics, USTC. Nov 2023

Dissertation Title:

Numerical study of the kinetic evolution of non-thermal electrons in Tokamak and its influence on cyclotron radiation

Anhui University of Science and Technology (AUST), Huainan, China

Bachelor in Department of Applied Physics, AUST. June 2016

Skills:

- Plasma physics research: 2D MHD instability analysis, Kinetic simulation of Runaway electrons, electron cyclotron emission
- Software skills: Code V, Catia, Altium. HFSS, COMSOL Multiphysics
- Programming skills: MATLAB, Python
- Language skills: English, Mandarin.

RESEARCH EXPERIENCE:

Ph.D. Student Research Assistant with Professor. Jinlin Xie (jlxie@ustc.edu.cn),

October 2017 -- November 2023 **University of Science and Technology of China**

- Design the frequency selective surface for millimeter-wave imaging diagnostics on EAST tokamak, Quasi-optical anti-reflection surface.
- Build 2D beam tracing simulation program based on Finite Difference Time Domain code.
- Develop the millimeter-wave (transmitter/receiver/local oscillator) optics system for Electron Cyclotron Emission Imaging and Microwave Imaging Reflectometer on EAST tokamak.

- Mechanical design for EAST millimeter-wave imaging diagnostics' optics housing and shielding crates
- Analysis the runaway electron and its emission in tokamak with kinetic equation.
- Operate millimeter-wave imaging diagnostics on EAST tokamak

Master Student Research Assistant with Professor. Wandong Liu (wldiu@ustc.edu.cn),
October 2016 -- September 2017 **University of Science and Technology of China**

- Operate millimeter-wave imaging diagnostics on EAST tokamak.
- Data interpretation for EAST Electron Cyclotron Emission Imaging experimental result.

PUBLICATIONS:

1. *Improvement of transmittance using groove structured surface for microwave imaging diagnostics in tokamak plasmas.* <https://ieeexplore.ieee.org/document/9370606>
2. *Diagnostic capacity of electron cyclotron emission imaging system with continuous large observation area on EAST tokamak.* <https://pubs.aip.org/aip/rsi/article/89/9/093503/359757>
3. *Bench test of microwave imaging reflectometry system for EAST tokamak* <https://iopscience.iop.org/article/10.1088/1748-0221/15/03/C03036>
4. *In situ relative self-dependent calibration of electron cyclotron emission imaging via shape matching* <https://doi.org/10.1063/1.5038866>
5. *Evaluation of optical performance of microwave reflection imaging system on EAST tokamak* <http://www.hjby.ac.cn/CN/Y2022/V42/I2/187>

Presentations:

- Oral presentation: The 8th Graduate Academic Forum on Plasma Physics and Fusion Engineering, USTC, China (May 2023)
- Poster: The 45th International Conference on Infrared, Millimeter, and Terahertz Waves (Nov 2020)
- Oral presentation: 2023 Plasma Mixture Simulation Workshop, HeFei, China. (Oct 2023)

Student mentoring experience:

1. **Ziwei Qiang** (2019 - 2023), University of Science and Technology of China , “Sawtooth recognition by Electron Cyclotron Emission Imaging on EAST ”. (Ph.D.)

2. **Yunjiao Zhang** (2019 - 2023), University of Science and Technology of China , “Automatically bad channel recognition and substitution of ECEI by SVM(Support Vector Machine)”. (Ph.D.)
3. **Yixiong Jiang** (2020 - 2023), University of Science and Technology of China , “Principal Component Analysis on Electron Cyclotron Emission Imaging”. (Master)
4. **Zihan Li** (2018 - 2023), University of Science and Technology of China , “Electron cyclotron emission intensity calculation and propagation in plasma ”. (Ph.D.)
5. **Dan Shao** (2022 - 2023), University of Science and Technology of China , “Active 2D millimeter-wave imaging reflectometer optics design and development”. (Ph.D.)
6. **Wenxiang Li** (2022 - 2023), University of Science and Technology of China , “ Runaway electron dynamic study and numerical simulation in fusion plasma”. (Ph.D.)
7. **Jinchen Yang** (2022 - 2023), University of Science and Technology of China , “ Ultrawide bandwidth F-band antenna design, development, laboratory testing.”. (Ph.D.)
8. **Lifu Zhang** (2018 - 2023), University of Science and Technology of China , “ Dual-band millimeter-wave optics combination and quasi-optics diplexer surface development ”. (Ph.D.)
9. **Feixue Gao** (2018 - 2023), University of Science and Technology of China , “ EAST Microwave Imaging Reflectometer experimental data interpretation”. (Master)

Working experience

- EAST tokamak (Hefei, China)

I have been deeply involved in the development and enhancement of optical systems for the ECEI (Electron Cyclotron Emission Imaging) and MIR (Microwave Imaging Reflectometer) systems on the Experimental Advanced Superconducting Tokamak (EAST) since 2016. These systems enable simultaneous measurements of density and temperature fluctuations in the same position within the challenging environment of a tokamak, a pivotal aspect of researching particle and energy transport phenomena. My primary contributions encompass data analysis and the innovative design of grooved optics surfaces aimed at minimizing reflection losses, which is pivotal in optimizing the accuracy and sensitivity of these measurements.

- Simulation (Hefei, China)

I have been developed the kinetic function simulation and synthetic diagnose of electron cyclotron emission (ECE) to analyze abnormal ECE signals during different discharge environments in tokamak. In the kinetic simulation, multiple physics aspects are considered, including avalanche electrons, stochastic perturbation of magnetic fields, Fokker-Planck function, synchrotron radiation backreaction and so on.

Certification of highest degree

博士研究生

徐新航

性别

男

1993

年

6

月

11

日生

于

2016

年

9

月至

2023

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11

月在

物理学

专业

全日制

学习

硕博

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学制

6

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修完

博士研究生

培养

计划

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课程

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毕业

培养单位:

校

长:

白信和

证书编号:

103581202301001397

2023

年

11

月

20

日

中华人民共和国教育部学历证书查询网址: <http://www.chsi.com.cn>

博士研究生
毕业证书



研究生 徐新航 性别 男，1993 年 6 月 11 日生，于
2016 年 9 月至 2023 年 11 月在 物理学
专业 全日制 学习，硕博连续，学制 6 年，修完博士研究生培养计划规定
的全部课程，成绩合格，毕业论文答辩通过，准予毕业。

培养单位：

校

长：

包信和

证书编号：

103581202301001397

2023 年 11 月 20 日

中华人民共和国教育部学历证书查询网址：<http://www.chsi.com.cn>



Doctoral Diploma

This is to certify that Mr. Xu Xinhang, born on 19930611, majoring in physics from September 2016 to November 2023, having completed all the courses required, and passed all the prescribed examinations and successfully defended his dissertation, has been awarded this diploma.

Date: Nov .20,2023

President: Bao Xinhe

University of Science and Technology of China

No. 1035 8120 2301 0013 97