Alberto Darjazi Dolaby

EDUCATION AND TRAINING

[1/10/2019 – 30/7/2022]

Bachelor's Degree

University of Pavia

City: Pavia | **Country:** Italy | **Field(s) of study:** Energy Engineering | **Final grade:** 110 L | **Thesis:** A Free Boundary Problem in Plasma Confinement

[30/5/2022 – 21/12/2024]

Master's Degree

University of Pavia

City: Pavia | **Country:** Italy | **Field(s) of study:** Electrical Engineering | **Final grade:** 110L | **Thesis:** Design of an Electronic Load for Emulating Frequency-Dependent Impedances in the Vertical Stabilization Coils of the Divertor Tokamak Test Facility

WORK EXPERIENCE

CREATE

City: Roma | **Country:** Italy

[2/2/2025 – Current]

Research engineer

I am currently working as a research engineer in the field of nuclear fusion. I collaborate with the DIvertor Tokamak Test facility in Frascati, Roma, to develop a frequency-dependent high-current load emulator which will be fundamental to test the already present power supplies for the in-vessel coils located in DTT.

In addition, I am testing and optimizing the dedicated power supplies for the DTT and conducting field tests to ensure compliance with the electrical constraints during construction.

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English (IELTS C1 Certificate)

LISTENING C2 **READING** C2 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

General Software

LaTeX | MS Excel | MS Word | MS Powerpoint

Programming

C++ | Python | MATLAB | LabVIEW | MATLAB/simulink | Simcenter MagNet | Auto Cad Inventor | Plecs

Soft Skills

Team Work | Communication

PUBLICATIONS

[2025]

Emulation of Frequency Dependence of Tokamak In-Vessel Coils by Impedance Fitting (Forthcoming)

After evaluating the RL frequency response of the electrical loads represented by the in-vessel coils located in the DTT facility, an approximation of their behavior was obtained using a Z-fit tool. In the paper "Emulation of Frequency Dependence of Tokamak In-Vessel Coils by Impedance Fitting" two approximations applicable for a real-life emulation of the loads starting from the Z-fit obtained was presented and sent for the evaluation to the conference of EEEIC 2025.

Authors: Ing. Alberto Darjazi Dolaby, Ing. Dott. Sabino Pipolo,Ing. Dott. Alessandro Lampasi | **Journal Name**: EEEIC 2025

[2025]

Design of a High-Current Electronic Load Emulator for Frequency-Dependent Impedances (Forthcoming)

A frequency-dependent RL load emulator for high-current application was presented in the paper "Design of a High-Current Electronic Load Emulator for Frequency-Dependent Impedances". These results, obtained while working on my master's thesis, were accepted for the ECCE 2025 Europe conference.

Authors: Ing. Alberto Darjazi Dolaby, Prof. Stefano Bifaretti, Ing. Dott. Sabino Pipolo,Ing. Dott. Alessandro Lampasi, Ing. Dott. Cristina Terlizzi, Prof.Pericle Zanchetta | **Journal Name**: ECCE 2025

[2025]

Adaptive Mix and Match Algorithm for Improved Linearly Approximated Solutions of the Optimal Power Flow Problem (Draft in Progress)

I have conducted research for the Department of Electrical Engineering at CCNY, New York, focusing on the optimization of power distribution systems. We are about to present a paper showing the results of an algorithm I wrote capable of picking the best constraints to formulate the OPF problem, by evaluating the impedance and the active and reactive power flows of each line of a power system.

Authors: Ing. Alberto Darjazi Dolaby, Prof. Panayiotis Moutis, Ing. Ioannis Vourkas

PROJECTS

[15/6/2024 – 21/12/2024]

Master's Thesis: Design of an Electronic Load for Emulating Frequency-Dependent Impedances in the Vertical Stabilization Coils of the Divertor Tokamak Test Facility

Driven by my passion for nuclear fusion and my ambition to establish Pavia as a key reference point in the EuroFusion roadmap, I successfully initiated a collaboration between the University of Pavia, ENEA, and the University of Tor Vergata in Rome. As part of this partnership, I worked alongside Engineer Alessandro Lampasi and Professor Stefano Bifaretti on simulating a modular RL load designed to replicate the behavior of the vertical stabilization coils at the Frascati research facility. These simulations leverage a Power Hardware-in-the-Loop system, which will interface with the actual power supply of the Divertor Tokamak Test, Italy's premier nuclear fusion research facility. Beyond advancing plasma confinement within Tokamak reactors, this research has broad industrial applications in load simulation. Given the promising results obtained, I have been awarded a scholarship by the Consortium CREATE to finalize the project and publish the findings. This grant is funded by European research initiatives in the nuclear sector.

Supervisor: Prof. Pericle Zanchetta

[10/1/2024 – 10/5/2024] **Studies on the HIDRA Experimental Reactor**

I worked at the "Nuclear Radiation Laboratory" of the University of Urbana-Champaign, Illinois, where I had the opportunity to study the behavior of the HIDRA experimental reactor and attend the "Fusion Engineering Technology" course.

[10/1/2022 – 30/7/2022] **Bachelor's Thesis: "A Free Boundary Problem in Plasma Confinement"**

- Independent study on Magnetohydrodynamics (MHD), plasma equilibrium in Tokamaks, with a specific focus on the study of conformal mapping techniques.
- Developed a Matlab code based on the paper: "A Free Boundary Tokamak Equilibrium" by H. Grad, A. Kadish, and D.C. Stevens (Comm. Pure Applied Math. 27, 1974).
- Successfully demonstrated the plasma shape within a Tokamak under specific conditions
- Supervisor: Prof. Ugo Pietro Gianazza

24/08/25