Leonardo Costa de Souza

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Education

UFPR (Federal University of Paraná) — *Curitiba, PR, Brasil*

PhD in Physics — *2020 - 2024*

- Supervisor: Ricardo Luiz Viana.
- Thesis: Fractal structures in open Hamiltonian systems.
- CNPq Scholarship.

UFPR (Federal University of Paraná) — *Curitiba, Brasil*

M.Sc in Physics — *2018 - 2020*

- Supervisor: Ricardo Luiz Viana.
- Dissertation: Anisotropic MHD equilibria in symmetric systems.
- CNPq Scholarship.

USP ESALQ (University of São Paulo - Escola Superior de Agricultura Luiz de Queiroz) — *São Paulo, SP, Brasil*

MBA in Data Science and Analytics — *2024 - current*

UFPR (Federal University of Paraná — *Curitiba, Brasil*

B.S in Physics — *2013 - 2018*

- Supervisor: Dante Homero Mosca Jr.

Research Experience

Postdoctoral Researcher — *São Paul, Brasil*

Funded by São Paulo Research Foundation (FAPESP) — *Mar. 2024 - current*

- Study of coupled Hamiltonian systems;
- Use of several techniques characterize the dynamics in a complex network;
- Study of magnetic field lines in Stellarators.

PhD student — *Curitiba, Brasil*

Funded by Conselho Nacional de Desenvolto Científico e Tecnológico (CNPq) — *Mar. 2020 - Feb. 2024*

- Use of several techniques to characterize transport effects in chaotic particle drift motion in tokamaks;
- Thesis: Fractal structures in Hamiltonian systems;

Master's student — *Curitiba, Brasil*

Funded by Conselho Nacional de Desenvolto Científico e Tecnológico (CNPq) — *Mar. 2018 - Fev. 2020*

- Study of MHD equilibrium and stability, for an anisotropic pressure tensor;
- Dissertation: Anisotropic MHD equilibria in symmetric systems.

Undergradute research — *Curitiba, Brasil*

Aug. 2015 - Jun. 2017

- Studied of solid state physics and magnetic proprieties;
- Studied of Kerr effect and manufacture of an magnetometer based on this effect;

Skills

Programming • Python, Mathematica, LaTex, Fortran and Julia.

Languages • Portuguese (Native), English (very good command, B2), French (good command, B2).

Publications

- L. C. Souza, M. R. Sales, M. Mugnaine, J. D. Szezech Jr, I. L. Caldas, R. L. Viana, *Chaotic escape of impurities and sticky orbits in toroidal plasmas*, Physics Review E, **109**(1) (2024)
- L. C. Souza, A. C. Mathias, I. L. Caldas, Y. Elskens, and R. L. Viana. *Fractal and Wada escape basins in the chaotic particle drift motion in tokamaks with electrostatic fluctuations*, Chaos, **33** (2023).
- L. C. Souza, A. C. Mathias, P. Haerter, R. L. Viana. *Basin Entropy and Shearless Barrier Breakup in Open Non-Twist Hamiltonian Systems*, Entropy, **25** 2023.
- P. Haerter, L. C. de Souza, A. C. Mathias, R. L. Viana, and I. L. Caldas. *Basin entropy and Wada property in the magnetic field line escape in toroidal plasmas with reversed shear*, International Journal of Bifurcations and Chaos, **33**(9) (2023).
- A. C. Mathias, L. C. de Souza, A. B. Schelin, I. L. Caldas, and R. L. Viana. *Fractal escape basins for magnetic field lines in fusion devices*, Journal of Applied Nonlinear Dynamics, **12**(4) (2023).
- L. C. Souza, and R. L. Viana. *Anisotropic Axisymmetric MHD Equilibria in Spheroidal Coordinates.* Brazilian Journal of Physics Vol. **50**(2) (2020).
- L. C. Souza, and R. L. Viana. *Anisotropic MHD equilibria in symmetric systems*, Physics of Plasmas, **26** (2019).