

**Cycle of studies:** Bachelor LT

**Degree course:** Physics

**Title of the thesis:** Plasma velocity during magnetic reconnection

**Type:** theoretical/modelling

**RFX Supervisor:** Marco Veranda

**Academic supervisor:** Tommaso Bolzonella

**Head of the RFX research group:** Susanna Cappello

**Leader of the RFX research program:** Lionello Marrelli

**Description of the thesis:** Magnetic reconnection is a change in the topology of magnetic field lines that confine plasmas. This phenomenon occurs continuously in both astrophysical and laboratory plasmas. An important effect of reconnection is the rapid release of the plasma's magnetic energy, which converts into the kinetic energy of its constituent particles.

This thesis deals with the main models to describe reconnection: the student learns the theory of reconnection using the magnetohydrodynamic model, and then focuses on the behavior of the velocity field. He will analyze the results of the model used to describe plasmas, and will deal with graphic visualization of the velocity field: this will help understanding better the dynamics of magnetic reconnection.

The work will take place at the theory and advanced simulation group at Consorzio RFX.

**Previous experience (if necessary):**

**Date:** September 22, 2022

**Status:** available

**Name of the student:**