

# Tesis Outline

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## 1 Introduction

- 1.1 Tokamak plasma control
- 1.2 Behind the plasma current
- 1.3 Thesis outline

## 2 Plasma control systems

- 2.1 Overview of control systems
- 2.2 MARTe framework
  - 2.2.1 MARTe architecture
  - 2.2.2 Hardware containers
  - 2.2.3 MARTe 2.0
- 2.3 Equilibrium and control algorithms
  - 2.3.1 PID control
  - 2.3.2 Multiple-Input Multiple-Output control

### **3 JT60-SA control design**

- 3.1 Machine description**
- 3.2 CREATE tools**
- 3.3 Controller designs**
- 3.4 QST tools implementation**
- 3.5 Simulation results**

### **4 ISTTOK**

- 4.1 Machine description**
- 4.2 Diagnostics and Actuators**
- 4.3 ATCA-MIMO-ISOL boards**
  - 4.3.1 Hardware layout**
  - 4.3.2 Real-time integration software**
- 4.4 Retrieving the contribution of plasma current**
- 4.5 Plasma centroid position determination**

### **5 ISTTOK results**

- 5.1 General Application Modules implementations**
- 5.2 PID control implementation**
- 5.3 Multiple-Input Multiple-Output control implementation**

### **6 Conclusions**