

# Tesis Outline

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## 1 Introduction

- 1.1 Research question
- 1.2 Tokamak control history and evolution
- 1.3 Behind the plasma current
- 1.4 Secção para introduzir os capitulos da tese e dar ligação entre o JT-60 e o ISTTOK... nome? .. Thesis outline?

## 2 Real-time feedback control

- 2.1 Plasma Control Systems (PCS's)
- 2.2 MARTe framework
  - 2.2.1 MARTe architecture
  - 2.2.2 Hardware
  - 2.2.3 MARTe's future
- 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 The ISTTOK device**

### **4.1 Machine description**

### **4.2 Diagnostics and Actuators**

### **4.3 ISTTOK's hardware**

### **4.4 Real-time signals integration and correction**

### **4.5 Extraction of plasma current contribution**

### **4.6 Plasma position reconstruction**

## **5 ISTTOK control results**

### **5.1 General Application Modules (GAM) implementations**

### **5.2 PID control**

### **5.3 Multiple-Input Multiple-Output control**

## **6 Conclusions**

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