Equilibrium control

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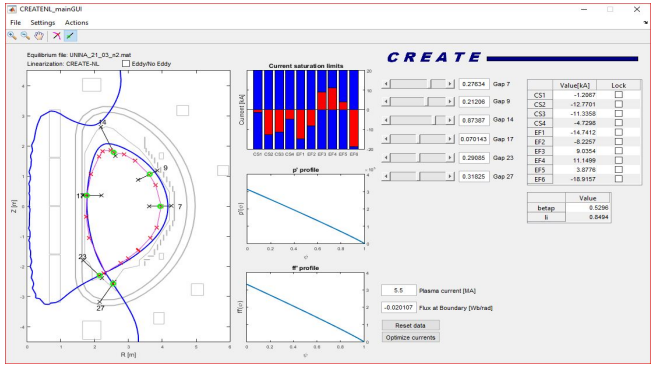
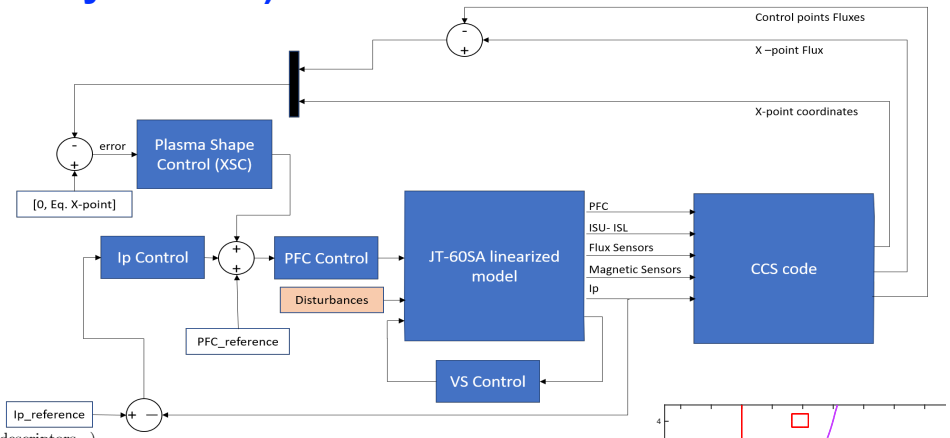
CONTENTS

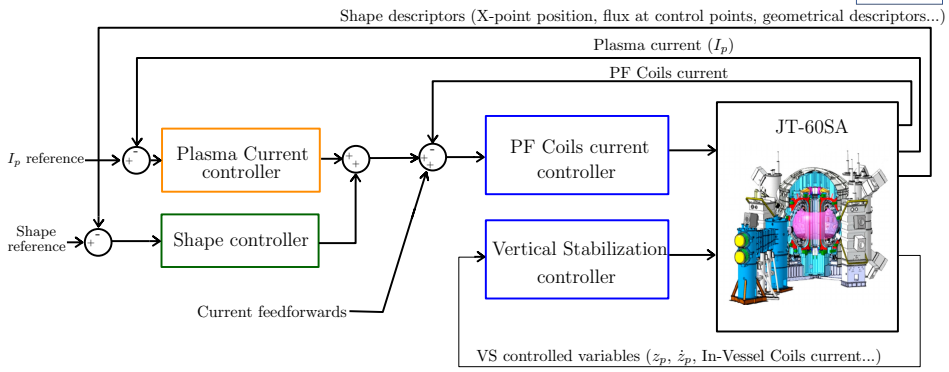
- **CREATE tools available for Equilibrium Control (developed in FP8)**
- **Proposal for 2021-2022**

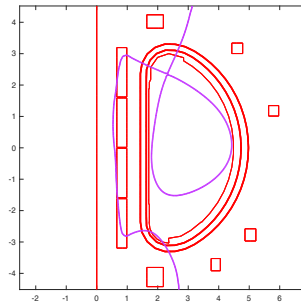
CREATE TOOLS FOR PLASMA MAGNETIC CONTROL DESIGN & VALIDATION

- **2D control-oriented modelling tools (CREATE-L and CREATE-NL) → capability to generate linear models for a generic equilibrium**
- **Customized Simulink library to easily build-up control-oriented simulation schemes that make use of the linear model**
- **Since 2016, these tools have been used to perform studies on the JT-60SA magnetic control system**
- **The same tools have been also coupled with the QST CCS (plasma boundary reconstruction) and FBC (Flux-boundary control) codes**









Proposal 2021-2022 - OP

1. Open-loop plasmaless model validation (in collaboration with RFX, currently ongoing within IC)

2. Add the capability to generate equilibria starting from experimental data in CREATE EGENE

3. Open and closed-loop plasma linear model validation

4. Learning QST tools (if it does not happen during IC)

Proposal 2021-2022 - CM

1. **Nonlinear simulation of the limiter-divertor transition (requires input from CEA - METIS profiles)**

2. **Reinforcement learning techniques for plasma vertical stabilization**