Control system optimization techniques for real-time applications in fusion plasmas: the RFX-mod experience

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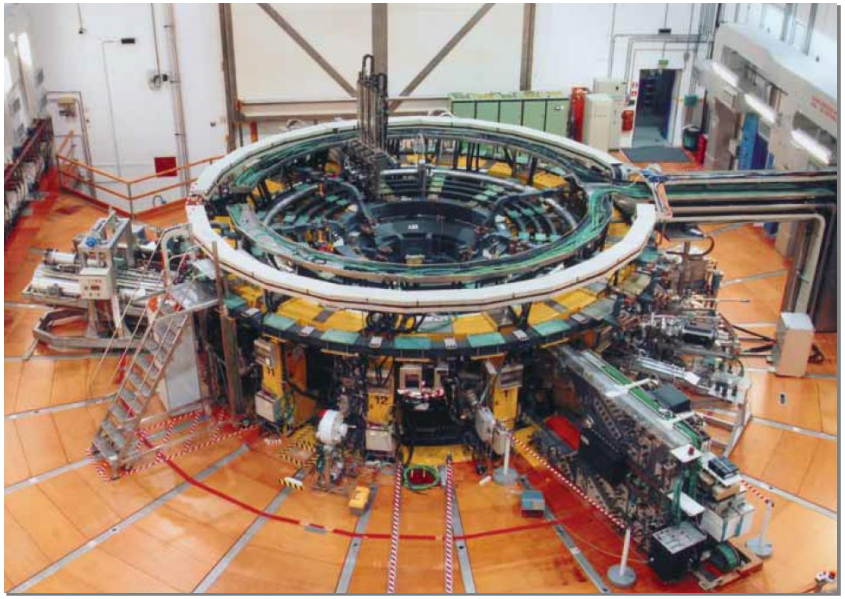
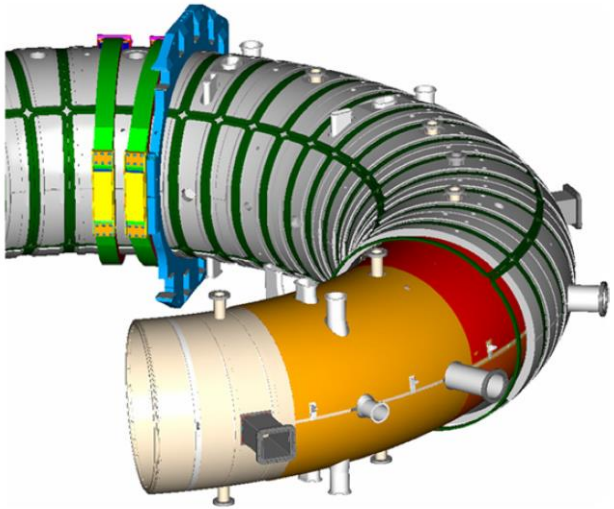
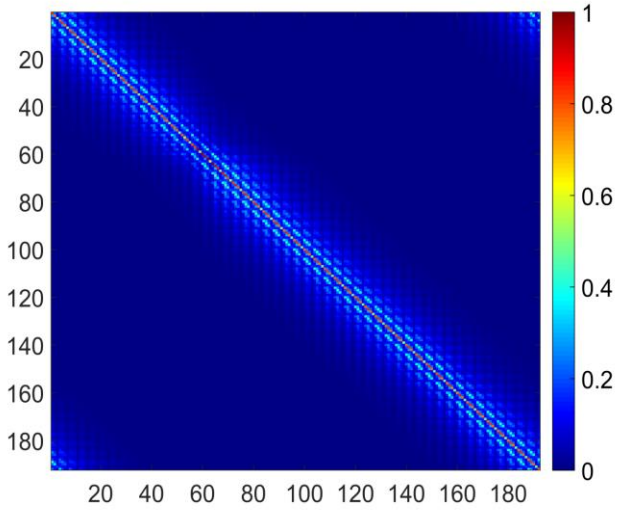


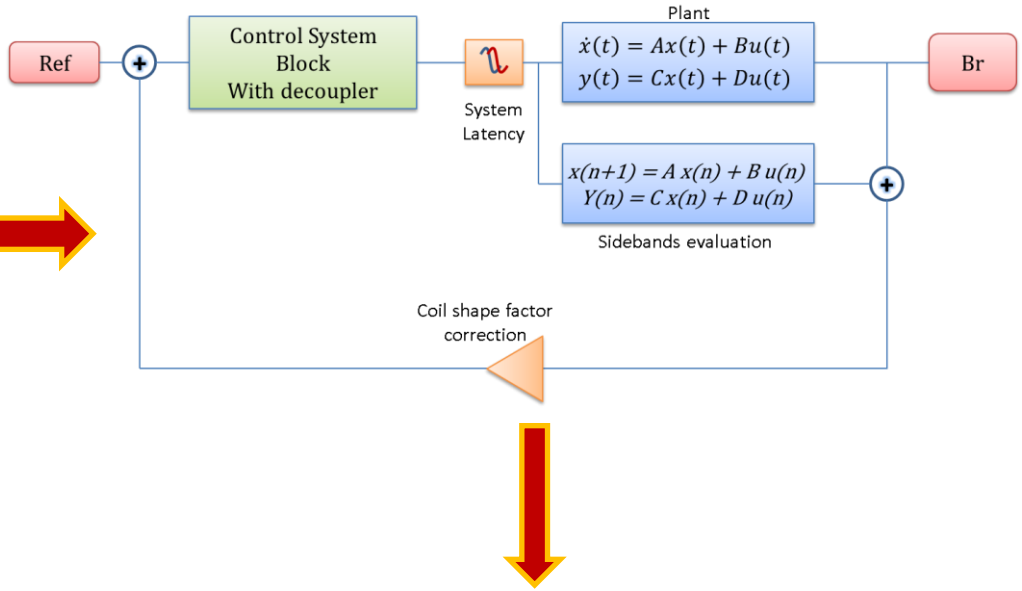


RFX-mod is a medium size (R=2m, a=0.459m) toroidal device dedicated to studying the magnetic confinement of fusion relevant plasmas.

It is equipped with an advanced feedback system for the control of magneto-hydro-dynamic instabilities: 192 active saddle coils and over 600 magnetic sensors.

A set of simple optimization techniques will be shown, allowing to assess the system external action on a given plasma and improve its effectiveness. Real time applicability is one of the main requirements.





- Derivation and implementation in time simulations and experiments of 'static matrix' based optimization methods
- Effect on harmonic distortion of output field with monochromatic input
- And much more!