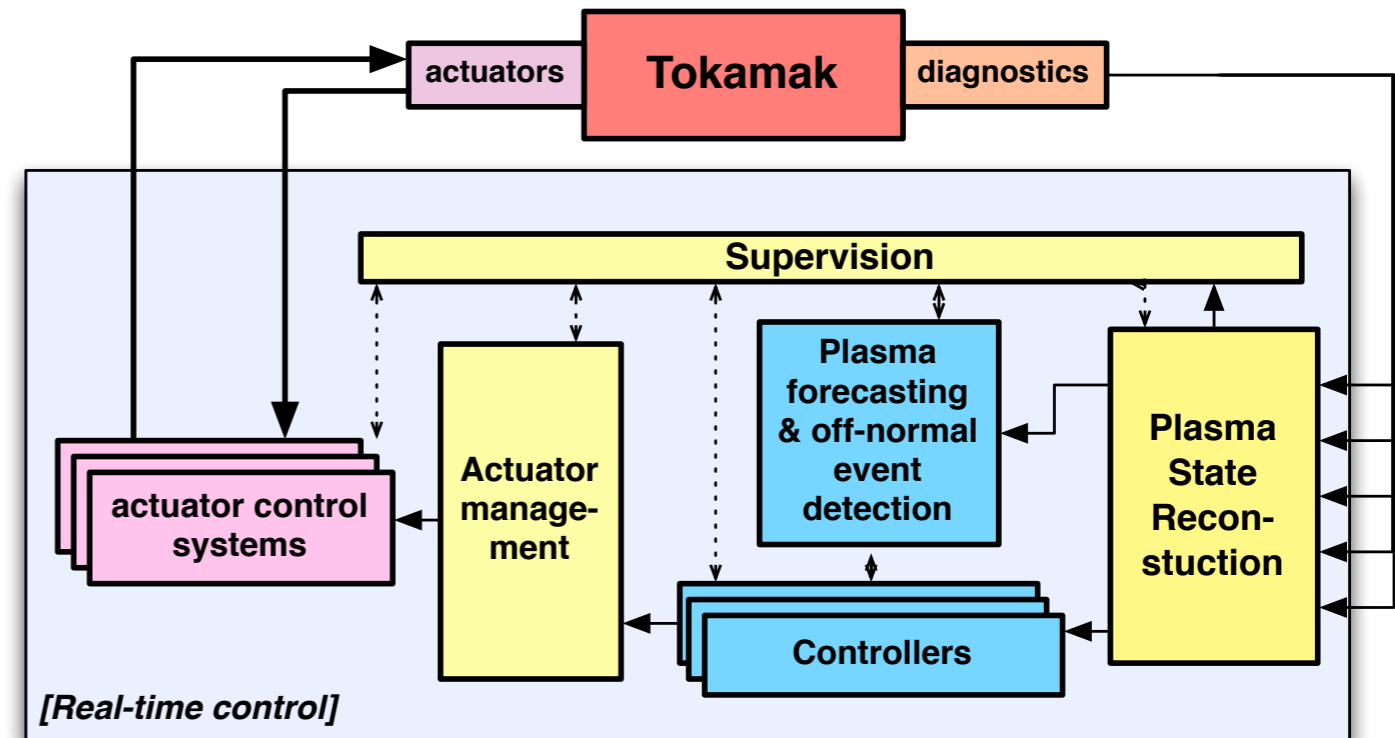


Real-time model-based plasma state estimation, monitoring and control on TCV, AUG and ITER

- **Future tokamaks will rely on advanced algorithms in PCS**
 - State estimation merging multiple diagnostics.
 - Model-based plasma controllers
 - Real-time actuator management
 - Plasma supervision
 - Model-based event prediction



- **These are being developed and tested on TCV and AUG in view of their application in ITER, examples:**
 - Real-time state reconstruction based on real-time RAPTOR code + RT-diagnostics
 - Predictive controller of plasma beta tested on TCV (figure right)
 - Numerical optimization of plasma evolution during ramp-up and ramp-down

