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## 2.25 The new magnetic diagnostics in the WEST tokamak

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The WEST (Tungsten [W] Environment in Steady-state Tokamak) tokamak aims at testing ITER divertor components to minimize risks for ITER divertor procurement and operation. It consists in a major upgrade of the superconducting medium size tokamak Tore Supra resulting in changing the circular magnetic configuration to a divertor configuration and implementing an ITER like actively cooled Tungsten divertor. Such modification has required rebuilding a full set of magnetic diagnostics to ensure the plasma boundary reconstruction, the plasma magnetic control and diamagnetic and MagnetoHydroDynamics measurements. For that purpose a set of 460 sensors has been integrated into the WEST vacuum vessel. After a brief description of the magnetic diagnostic specifications and integration, the paper discusses the commissioning of the diagnostic and the comparison with free boundary code reconstruction. The real time data processing providing the main plasma parameters is also presented. It is based on a description of the magnetic flux on a toroidal harmonic basis and is lasting less than 2 ms. The Simulink simulation framework used to test the equilibrium reconstruction and to develop the plasma controllers is described. Then results on plasma experiments and diagnostic performance are shown.

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