

Status of the COMPASS Upgrade Tokamak

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Abstract

COMPASS Upgrade, a medium-size tokamak ($R = 0.89$ m, $a = 0.27$ m) is under construction in Institute of Plasma Physics of the CAS in Prague. COMPASS Upgrade will provide unique capabilities: high magnetic field ($B_t = 5$ T), plasma current ($I_p = 2$ MA) and plasma density ($\sim 10^{20}$ m⁻³) combined with extensive auxiliary plasma heating power (starting with 4 MW of NBI with foreseen future extension up to in total 14 MW of combined NBI and ECRH). In addition, the device enable operation with a hot metallic first wall and vacuum vessel (300-500 °C).

Due to its capabilities and plasma conditions, the COMPASS Upgrade tokamak will be able to efficiently support the ITER operation as well as address some of the key challenges for the DEMO construction and operation. Namely, it will focus on the divertor physics at DEMO relevant conditions including plasma exhaust under extreme heat fluxes and advanced confinement modes.

The contribution will introduce the design of the tokamak and its subsystems as a massive stainless steel support structure, Inconel vacuum vessel, demountable copper toroidal field coils and poloidal field coils. In addition, auxiliary plasma heating as well as power supply systems will be described. The contribution of COMPASS Upgrade to the EUROfusion Roadmap will be discussed as well.