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Conceptual design of the COMPASS-U tokamak

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The Institute of Plasma Physics of the CAS in Prague has recently started construction of new COMPASS-U tokamak. It will be a compact, medium-size (R = 0,85 m, a = 0,3 m), high-magnetic-field (5 T) device. COMPASS-U will be equipped by a flexible set of poloidal field coils and capable to operate with plasma current up to 2 MA and, therefore, high plasma density (~ 10^20 m^-3). The device is designed to generate and test various DEMO relevant magnetic configurations, such as conventional single null, double null, single and double snow-flake. The plasma will be heated using 4 MW Neutral Beam Injection (NBI) heating system with future extension by at least 4 MW Electron Cyclotron Resonant Heating (ECRH) system.
COMPASS-U will be equipped with lower and upper closed, high neutral density divertors. Due to high PB/R ratio COMPASS-U will represent a device which will be able to perform ITER and DEMO relevant studies in important areas, such as the plasma exhaust or development of new confinement regimes. The divertors will use conventional materials in the first stage, however, in the later stage, the liquid metal technology, which represents a promising solution for the power exhaust in DEMO, will be installed into the lower COMPASS-U divertor. The metallic first wall will be operated at high temperature (approx. 300 ℃) during plasma discharge, which will enable to explore the edge plasma regimes relevant to ITER and DEMO operation. The first plasma is scheduled for 2022.
In this contribution, we will present the conceptual design of the COMPASS-U tokamak as well as the main tokamak components.

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