



Contribution ID: 363

Type: **not specified**

P4.027 The current status of the system additional heating of the complex of TSP TRINITI and objectives of modernization for the project of tokamak Ignitor

Thursday, 20 September 2018 11:00 (2 hours)

The paper presents the ICR-heating system of the TSP TRINITI complex: purpose; features of implementation; characteristics; power supply system; physical condition; and also discusses the possibility of upgrading the system of ICR-heating of the TSP TRINITI complex for the Ignitor project.

According to the project of tokamak Ignitor to accelerate the plasma ignition and facilitate the access to high confinement regimes such as the H and I regimes need a system of ICR-heating of the 8 generators with frequencies of 80÷115 MHz (115 MHz: $B_t=13T$, $I_p=11MA$ full performance scenario; and 80 MHz: $B_t=9T$, $I_p=6-7MA$ reduced performance scenario), the maximum power of the generator 2 MW at 80 MHz and 1 MW at 115 MHz, the pulse duration to 4s [1].

The RF system was created for ICR-heating of the plasma of the TSP TRINITI at the power level of 2 MW with a frequency <30 MHz in the pre-compression stage of the discharge ($B_t=2T$, $n_e=0,5 \times 10^{20} m^{-3}$, $\tau_{RF}=0,1s$) to improve the efficiency of adiabatic compression of the plasma. The mechanism of absorption of fast waves at cyclotron frequency of small additive of ions $++He^3$ was used as the main method of heating D or D-T plasma of the TSP TRINITI. The RF system (2 MW, 20 MHz) was successfully tested at the TSP TRINITI [2].

Technical proposals are being developed to upgrade both the RF system and the power supply of the TSP TRINITI complex in accordance with the current requirements of the tokamak Ignitor project.

References

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2. Mimov S.V., Kovan I.A., Azizov E.A. et al., Proc. 16th International Conference on Fusion Energy, Montreal, 1996, IAEA, v.1, p.763, Vienna, 1997.

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Session Classification: P4