The study of turbulences during L-H transition in the spherical tokamak Globus-M2 using Doppler backscattering.

A.M. Ponomarenko, V.V. Bulanin, A.V. Petrov, A.Yu. Yashin

Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russian Federation

Email: annap2000dreeonn@gmail.com

Investigating the transition to H-mode (an improved confinement regime characterised by the increase of energy confinement time) is of great importance as the success of future thermonuclear reactors depends on our understanding of the mechanisms and factors involved in its formation [1]. There is much active discussion around the topic and at the moment it is believed that anomalous transport and turbulence suppression play a role in the L-H transition. Different methods have been undertaken to study and observe the transition to H-mode. Doppler backscattering (DBS) is useful in providing insight into various characteristics and properties of the L-H transition [2].

Another challenge that arose during the investigation of the H-mode was the fact that it manifests itself differently in spherical tokamaks. Research into this is already on the way on the spherical Globus-M2 tokamak [3] but many aspects of the L-H transition are yet to be analyzed. To investigate turbulences in both core and peripheral regions of the plasma during transition to H-mode two installed DBS systems with 10 channels were used.

The investigation of the temporal evolution of turbulences in various discharges during the L-H transition yielded the observation that there is significant suppression of turbulences in the periphery while no dramatic decrease in turbulence is visible in the more inner regions of the plasma. Further analysis of the DBS signal also highlighted a shift of the centre of gravity of spectrograms after the transition to H-mode.

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