Fast scanning probe on the globus-m2 tokamak

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Processes proceeding in SOL and in the plasma boundary play an important role in achieving a steady state burning fusion plasma [1], and also affect on the global plasma confinement, which makes the investigation of plasma parameters an actual task. Electrical probes are one of the mostly common diagnostics, which is successfully used to investigate edge plasma. Since the 80s of the last century [2], so-called “fast reciprocating probes” have become widely used on tokamaks. These probes allow obtaining profiles of plasma parameters with a high spatial resolution within a short time interval and thus minimizing the perturbations to plasma and damages to the probe itself [3].

In this work we describe fast scanning probe for the Globus-M2 tokamak. A drive of the probe is electric motor which is connected with crankshaft mechanism with the help of gear system. Crankshaft, in turn, is responsible for reciprocating movement of rod with probe head. The mechanism’s stroke length is 6 cm, and velocity is less than or equal to 4 m/s. A nine-pin probe head is used for measurements of plasma parameters. It design characteristics allow measuring electron temperature, density, radial and poloidal electric fields and Mach number. The nine-pin head was successfully tested with the movable probe on the Globus-M tokamak [4].

References

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