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4.22 Development of A Langmuir Probe Array for Mode Conversion Research

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To evaluate and monitor the edge electron density distribution, which decides the location and efficiency of X-B or O-X-B mode conversion, a Langmuir probe array with high spatial and temporal resolution is developed for Sino-UNited Spherical Tokamak (SUNIST). The probe array consists of 37 single molybdenum probes, constituting 12 triple probes at a step of 4mm. In consideration of characteristic frequency of magnetohydrodynamics (MHD) behaviors (<20kHz) and main turbulent perturbations (~50kHz) for SUNIST, the bandwidth of the probe array is set to 60kHz, capable of evaluating influences of these instabilities on mode conversion process. Experimental results have proven that the Langmuir probe array can give a clear boundary density distribution with high temporal resolution.

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