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Measurement system of PSM HVPS for neutral beam injection on HL-2A

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In order to improve the experimental parameters on the HL-2A device and meet the requirements of the HL-2A modification, the capability and pulse duration of the auxiliary heating system should be improved greatly. The high voltage power supply (HVPS) which is based on PSM technology is a method of controlling the total output voltage of many identical DC choppers connected in series by means of managing the on and off of modules step by step and modulating their pulse widths in a certain sequence. The neutral beam injection auxiliary heating system should have high output power (80kV/200A), high accuracy of the output voltage (1%), flexible control, very high overall efficiency, very low amount of stored energy (when loads are arcing) and can be switched off immediately ($< 15\mu\text{s}$). It is necessary to design stable and precise measurement system that is basic premise and important guarantee for these features, especially for the sampling data, system control and protection reliability. The paper describes the measurement system (the slow signal bandwidth is about 0-20kHz, the fast signal bandwidth is about 0-250kHz) which is composed of various kinds of transducers (HV divider, AC and DC current transducer), isolation transmission, industry control machine and PCI based data boards. The experiment results show that the measurement system is flexible and stable.

Eligible for student paper award?

No

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