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## Design and implement of Varying Frequency Three-phase Synchronous Signal processing system Based on modern signal processing

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In HL-2M the magnetic field power supply includes CS power supply and sixteen poloidal field power supplies. Each power supply is consists of three-phase full bridge thyristor converters and phase control is used to fire thyristor. The AC power of magnetic field power supply is provided by a six-phase motor generator with two Y windings of shifting 30°. The AC voltage waveform is distorted due to heavy loads, and the frequency of generator outputs is changed during the pulse of plasma shot. So it is difficult to obtain clean and precise synchronous voltage for thyristor firing system. In order to enhance control precision and reliability of power supply, a new three-phase synchronous signal process test platform is developed. The simulation results in test platform show that the method is feasible. Then, the new synchronous processing system is founded. Through real-time data acquisition system three-phase synchronous AC signal are inputted. Digital filter technology is used to deal with input signal and according real-time frequency and phase bias compensation phase is realized by FPGA. And different phase of synchronous signal can be gained through this new system. The experimental results show that the three-phase synchronous signal processing system meets the design requirement.

### Eligible for student paper award?

No

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