

技术及应用

积分分离的电子回旋共振加热高压脉冲电源模糊控制研究

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摘要 基于四极管的电子回旋共振加热高压脉冲电源是支持回旋管工作的关键组件, 对稳态误差精度和响应速度等性能有较高的要求。分析了电源系统的工作原理, 给出了数学模型。针对四极管的非线性特点和电源的控制要求, 将智能控制方法与电源技术相结合, 提出积分分离模糊控制器的控制策略。通过仿真实验, 与传统PID控制策略进行比较, 结果表明, 该控制器具有抑制超调、自适应自调节的功能, 为实现高性能的负高压脉冲电源提供了一种新的控制策略, 同时也为智能化数字控制的实现打下基础。

关键词 [高压脉冲电源](#) [积分分离](#) [模糊控制](#) [自调节](#)

分类号

Fuzzy Control of High-Voltage Pulse Power Supply for Electron Cyclotron Resonance Heating Based on Integral-Separate Method

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Abstract The negative high-voltage pulse power supply for the electron cyclotron resonance heating (ECRH) is a key support to the cyclotron's functioning and good performance is highly required. The principle of operation was analyzed and the model was given. According to the nonlinear characteristics of tetrode and the supply's control requirements, fuzzy control theory based on integral-separate was adopted, which combined intelligent control with power technology. Simulation results show that this system has good overshoot-restrained, self-adaptive and auto-negotiating abilities using this method in comparison with PID method. This is a good new control and will be benefit to digital control intelligently.

Key words [high-voltage](#) [pulse](#) [power](#) [supply](#) [integral-separate](#) [fuzzy](#) [control](#) [auto-negotiating](#)

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扩展功能

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