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技术及应用

# 基于不同激励源模式下并联型怀特电路特性

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摘要 在快周期同步加速器中，为避免无功能量存取对电网的扰动，磁铁电源系统通常采用怀特电路结构。在并联型怀特电路中，降低磁铁电流的高次谐波含量，即电流总谐波畸变率（THD）是保证磁铁电流跟踪精度的关键所在。本文基于一单元并联型怀特电路模型，详细分析了在不同激励源模式下磁铁电流的动态特性，并获得实验验证。结果表明，连续激励模式更有利于改善磁铁电流的THD指标。

关键词 电源系统 谐波总畸变率 跟踪误差

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# Dynamic Response of Parallel Resonant Circuit With Different Power Excitations

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**Abstract** In order to avoid drawing a large reactive power from the alternating current line, the White circuit type resonant network is adopted widely as the structure of the magnet power supply system of the rapid-cycling synchrotron. Reducing the total harmonic distortion （THD） of the magnet current in the parallel resonant network is the key technique for the magnet current tracking accuracy. Based on the dynamic response analysis of a single mesh parallel resonant circuit in the paper, it shows that the continuous power excitation is of great benefit to reducing the magnet current harmonics. The paper also gives a description of our experimental studies on the dynamic response with the pulse and continuous power excitation in a parallel resonant network model.

**Key words** power supply system _ total harmonic distortion _ tracking error

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通讯作者