

论文

基于巨磁电阻效应的电流传感器技术及在智能电网中的应用前景

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摘要:

介绍智能电网中电流的传感和量测技术发展的要求和新趋势, 阐述智能电网中各种电流传感器的原理和特点, 比较了传统电磁式电流传感器(如CT, 罗氏线圈, 霍尔)和几种新型的电流传感器(如光纤, 巨磁电阻)的优缺点。在分析智能电网的电流测量需求的基础上, 结合巨磁电阻(giant magneto resistive, GMR)电流传感器的研究内容着重展望了GMR电流传感器在智能电网中的应用前景。最后总结了GMR传感器在智能电网测量应用中的优势和不足, 并针对这些不足, 指出了后续研究的方向。

关键词: 电流传感器 分布式测量 巨磁电阻效应 智能电网

Review of Current Sensor Technology Based on Giant Magneto Resistive Effect and Possible Applications for Smart Grids

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Abstract:

The requirements and trends of current sensing and measuring technology in smart grids are presented, and the principles and features of current sensors for smart grids are expounded. The merits and demerits of several traditional current sensors such as CT, Rogowski coil and Hall sensors as well as those of several new types of current sensors such as optical fiber CT and giant magneto resistive (GMR) current sensors are compared. The requirement of current measurement in smart grid are analyzed. Combining with the research on GMR current sensors, the applications of GMR current sensors in smart grids are emphatically prospected. The superiorities of applying the GMR current sensor in smart grids and its deficiencies are summarized, and the follow-up research direction of GMR current sensors are pointed out.

Keywords: current sensor distributed measurement giant magneto resistive (GMR) effect smart grids

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