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BIO

DXiaofeng Yang (Senior Member, IEEE) received the B.S. and Ph.D. degrees from Beijing Jiaotong University, China, in 2003 and 2011, respectively, all in electrical engineering. From 2003 to 2005, he was power supplier engineer of the seventh Research Institute of China Ministry of Information Industry, Guangdong. From 2012 to 2014, he was a Postdoctoral Fellow at North Carolina State University, Raleigh, NC. Currently, he is Associate Professor of Beijing Jiaotong University. Dr. Yang serves as the Steering Committee Member of IEEE TEC Beijing Chapter, the Deputy Secretary General of the Youth Working Committee of Council of Beijing Power Electronics Society, member of the Youth Working Committee of Council of China Power Supply Society, Associate Editor of Urban Rail Transit, Associate Editor of IEEE ACCESS, Deputy Editor-in-Chief of Electrical Engineering (Chinese Journal). Dr. Yang holds 24 Chinese patents, 1 United States patent, and has published more than 100 technical papers, his current research interests include rail transit power supply, high power energy converter, and rail transit power supply. He received the Outstanding Author Award from Proceedings of the Chinese Society of Electrical Engineering in 2018, Outstanding Author Award from Power System Technology in 2016 and 2017. Three papers had been selected as the "Forerunner 5000- Top Articles in Outstanding S&T Journals of China" (F5000).

ABSTRACT:

Stray Current in Rail Transit Electrification: History, Challenges and Opportunities

As an important part of public transportation, rail transit has been developed rapidly in recent years all over the world. On the one hand, huge amounts of AC high-speed rail transit are generally deployed for long-distance transportation among cities. On the other hand, DC urban rail transit is widely constructed to ease the public traffic inside cities. Different from conventional on-road transportation including electric vehicles and buses, rail transit electrification shows its own characteristics. Safety power supply is essential for such heavy-duty rail transit. For a long time, the inherent stray current issue in rail transit electrification has been ignored by related fields. But many related accidents in recent years have aroused people's concern about this issue. This tutorial will systematically introduce the rail transit electrification with special focus on stray current issue. It will cover the following contents: The history and development of rail transit (high speed rail transit and urban rail transit) electrification. Summarizing the existing challenges in safety power supply of rail transit; Considering the potential harm of stray current issue in rail transit electrification, the generation mechanisms and corresponding existing solutions will be classified and compared. This also inspired continued efforts of the researchers, experts from both academia and industry. Finally, the emerging opportunities will also be concluded for future prospective applications in the rail transit electrification. The study is funded by the key projects of National Natural Science Foundation of China, with a funding amount of more than 3 million RMB.

