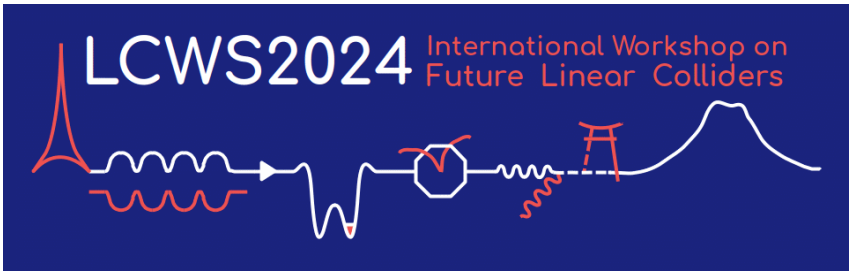

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CEPC Green Accelerator Technology Development

Tuesday 9 July 2024 16:00 (15 minutes)

The Circular Electron Positron Collider (CEPC) is a proposed high-energy physics facility designed to advance the frontiers of scientific research while maintaining a strong commitment to environmental sustainability. This paper explores the global trend towards greener accelerators and outlines the specific initiatives undertaken by the Institute of High Energy Physics (IHEP). International efforts have focused on enhancing integrated management capabilities, improving energy utilization efficiency of various measurements. IHEP's green initiatives for particle accelerators are noteworthy. These include the large-scale utilization of solar energy, the pioneering adoption of permanent dipole magnets in China for the High Energy Photon Source (HEPS) facility, the development of high-efficiency klystrons, improvements in the Q value of superconducting high-frequency cavities and superconducting magnets, recycling of liquid helium, optimization of large cryogenic systems, and the practical application of waste heat resources. However, the transition to greener accelerators faces some challenges and difficulties. These range from the need for new theories and schemes to technological limitations and economic considerations, etc. Despite these difficulties, the outlook is promising, with the potential for significant reductions in energy consumption, emissions, and waste generation. In summary, through the green initiatives and contributions to the global green accelerator movement of CEPC, it paves the way for a more environmentally sustainable future in particle accelerator facilities.

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