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Macroscopic quantum tunneling of phase-locked fluxons in coupled long Josephson junctions JU KIM, University of North Dakota, KYUNG-SUN MOON, Yonsei University — Macroscopic quantum tunneling (MQT) of phase-locked fluxon- fluxon (FF) and fluxon-antifluxon (FAF) pairs from a metastable state in two inductively coupled long Josephson junctions (LJJ) is investigated. We show that, in the absence of a magentic field, the fluxons in the FF pair and the fluxon and antifluxon in the FAF pair tunnel as independent particles when the magnetic induction effect is weaker than the pinning effect due to columnar defects. However, the FAF pair tunnel coherently as a single quantum particle when the magnetic induction effect becomes stronger. We show that the tunneling rate is modified by the magnetic induction effect.

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