

On Bosonic Magnetic Flux Operator and Bosonic Faraday Operator Formula

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(Received: 2005-12-26; Revised:)

Abstract: In the literature about mesoscopic Josephson devices the magnetic flux is considered as an operator, the fundamental commutative relation between the magnetic flux operator and the Cooper-pair charge operator is usually preengaged. In this paper we show that such a relation can be deduced from the basic Bose operators' commutative relation through the entangled state representation. The Faraday formula in bosonic form is then equivalent to the second Josephson equation. The current operator equation for LC mesoscopic circuit is also derived.

PACS: 03.65.-w, 42.50.Dv

Key words: magnetic flux operator, Faraday operator, mesoscopic Josephson junction, LC mesoscopic circuit, entangled state representation

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