Dedication

To my Mother

To my Father

To Muzamel

To my sisters and brother

To my friends and colleagues

To all who help me

Acknowledgment

my great thank and love to Allah who helps me to prepare this research.

It is my pleasure to thank sudan university of science and technology , beside graduate college in addition to the college of science and department of physics for facilities and encouragement .I would like to express my gratitude to professor Mubarak Dirar Abd alla , my supervisor, for his kind supervision and faithful suggestions .

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Abstract

The physical properties of superconductors is not well understood . there is no unique satisfactory model that can explain all superconductors phenomena . there is a need to develop theoretical models that can lead to a full unique acceptable model .

This work aims to contribute to the superconductivity by explaining Josephson effect on the basis of a simple quantum model .In this simple model new Schrödinger equation is derived from which a simple Josephson current density expression is obtained .

This expression coincide with the usual ordinary one .

ملخص

الخواص الفيزيائية للموصلات الفائقة ليست موضحة بصورة جيدة و لا توجـد نمـاذج مرضية فريدة من نوعها يمكـن أن تفسـر كـل الظـواهر للموصـلات الفائقـة, هنـاك حاجة لتطوير نماذج نظرية من الممكن أن تؤدي إلى نموذج مقبـول فريـد متكامـل.

يهـدف هـذا العمـل إلـى المسـاهمة فـي الموصـلية الفائقـة مـن خلال شـرح تـأثير جوزيفسون على أساس نموذج الكم بسيط. وفـي هـذا النمـوذج البسـيط المسـتمد من معادلة شرودنجر الجديدة التي من خلالها يتم الحصول علـى الصـيغة المبسـطة لكثافة تيار جوزيفسون ,هذا التعبير يتزامن مع الصيغة المعتادة لجوزيفسون .

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