Dedication

I dedicate this thesis

To my parents…

To my confidants…

And

To my fiancée …

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Acknowledgement

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Abstract

In this work quantum treatment for two metal contacts in a super-conducting state is done. A useful expression for the input and output current is found by using the notion of the current density in quantum mechanics.

The conditions required by this contact to act as a rectifier and amplifier are discussed .It found that certain restrictions should be imposed on the potential and the wave number for the metal contact to act as a rectifier or an amplifier.

ملخص البحث

فى هذا البحث تمت المعالجة الكمية لوصلة معدنيه مكونة من معدنين متلاصقين فى حالة توصيل فائق . وتم الحصول على صيغ رياضية لتيار الدخل و الخرج باستخدام مفهوم كثافة التيار فى ميكانيكا الكم .

و قد نوقشت الظروف التى يعمل عندها الوصلة المعدنية كمقوم وكمكبر للتيار و قد وجد أن هناك قيودا يجب أن تفرض على الجهد و العدد الموجى لتعمل الوصلة المعدنية كمقوم و كمكبر.

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