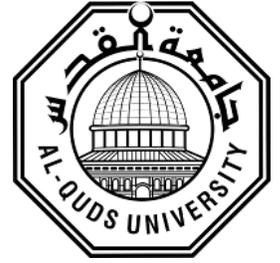


**Deanship of Graduation Studies
Al-Quds University**



**Design and Simulation of a Stretchable and Reversibly Deformable MIMO
Monopole Patch Antenna for UWB Applications with High Isolation**

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M.Sc. Thesis

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Design and Simulation of a Stretchable and Reversibly Deformable MIMO Monopole Patch Antenna for UWB Applications with High Isolation

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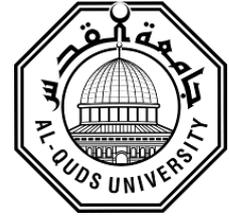
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Thesis Approval

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1440/2019

Declaration:

I Certify that this thesis submitted for the Degree of Master is the result of my own research, except where otherwise acknowledged, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed by : 

Watan Zafer

Date: 5/8/2019

Dedication

I dedicate this work to my family and anyone who cares

Watan Zafer

Acknowledgement

I would like to thank everyone who has helped me in life to reach this level. At this moment, I would like to thank my lecturers in engineering college mainly my supervisor for this project Dr. Mohammad Koali, I would like to thank him for guiding through my last two semesters.

I would like to deeply thank my mother, father, husband and all of my family for their support, helping and pursuing me during my study. Finally, my experience would not have been possible without God. Thanks a lot all.

ABSTRACT

The need to produce light weight and cheap components and devices has been the driving force for macro-electronics. Electronics that can be stretched and/or conformal to curvilinear surfaces has recently attracted broad attention so some microwave components are studied in our thesis.

In this work a design of printed rectangular monopole antenna for Ultra-Wide Band (UWB) applications is presented. The printed antenna is designed by using HFSS program to achieve the best reflection coefficient. Moreover, the stretching effect on the antenna response is studied along x-axis and y-axis. Also, compact UWB Multiple-Input Multiple-Output (MIMO) antennas are designed. In order to enhance impedance matching and improve the isolation, each UWB MIMO antenna which consists of two comparable monopole elements is proposed with different slotted stubs on the ground plane. The reflection coefficient, mutual coupling, peak gain and radiation patterns are analysed.

نمذجة و محاكاة هوائي أحادي القطب متعدد المداخل و المخرجات مطاطي قابل للثني

لتطبيقات النطاق العريض باستخدام طرق عزل فعالة

اعداد: وطن فايز ظافر

اشراف: د. محمد كوعلي

ملخص:

إن الحاجة إلى إنتاج عناصر و أجهزة خفيفة الوزن و رخيصة الثمن هي القوة الدافعة باتجاه macro-electronics. لقد جذبت الإلكترونيات التي يمكن مدها و / أو مطابقتها للأسطح المنحنية اهتمامًا واسعًا مؤخرًا ، لذا تمت دراسة بعض microwave components في أطروحتنا. في هذا العمل ، تم طرح تصميم لهوائي monopole مستطيل مطبوع لتطبيقات النطاق العريض (UWB). تم تصميم الهوائي المطبوع باستخدام برنامج HFSS لتحقيق أفضل معامل ارتداد. علاوة على ذلك ، تمت دراسة تأثير المط على استجابة الهوائي على طول المحور السيني والمحور الصادي. كما تم تصميم هوائيات compact UWB MIMO. من أجل تحسين impedance matching و العزل، يُقترح أن كل هوائي UWB MIMO يتكون من two comparable monopole elements يتم تصميمه بعمل قطوع في المستوى الأرضي له. وقد تم تحليل معامل الارتداد mutual coupling معامل التكبير وأنماط الإشعاع.

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