

الآية

بسم الله الرحمن الرحيم

أَلَمْ تَرَوْا أَنَّ اللَّهَ سَخَّرَ لَكُمْ مَّا
فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ
وَأَسْبَغَ عَلَيْكُمْ نِعَمَهُ ظَاهِرَةً
وَبَاطِنَةً وَمِنَ النَّاسِ مَن يُجَادِلُ
فِي اللَّهِ بِغَيْرِ عِلْمٍ وَلَا هُدًى وَلَا
(كِتَابٍ مُّنبِئٍ

سورة لقمان

(آية 20)

DEDICATION

- **To the spirit of my father that did not go
away, never**
- **To my mother who always accompanied me
to the path of success**
 - **To all my family
and**
- **To all my friends and my loved ones**

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ABSTRACT

Long Term Evolution is currently being standardized in 3GPP with the aim of more than twice the capacity over High-Speed Packet Access. The chosen multiple access for uplink is Single Carrier FDMA, which avoids the intra-cell interference typical of CDMA systems, but it is still sensitive to inter-cell interference.

As a result, the role of the power control becomes decisive to provide the required SINR, while controlling at the same time the interference caused to neighboring cells. This is the target of the Fractional Power Control (FPC) algorithm lately approved in 3GPP.

In this thesis, the OLPC is studied in detail to obtain a reference performance, and then all techniques are proposed with the aim of improving it. All techniques are implemented on a static simulator that models slow variations.

The comparison of the result among the different techniques is carried out by considering key performance indicators like the cell outage and cell throughput.

المستخلص

التطور على المدى الطويل ويجري حاليا ضمن وحدة **3GPP** بهدف قدرة أكثر من مرتين خلال وصول الحزم عالية السرعة تم اختيار تقسيم إشارة تردد ناقل الوصول المتعدد كتقنية وصوله فى الارسال لانه يمنع التداخل الداخلى للخلية لكنها لاتزال حساسة اتجاه التداخل بين الخلايا

نتيجة لذلك قاعدة التحكم فى القدرة لها دور فعال فى اعطاء نسبة الاشارة الى التداخل و الضوضاء بقيمة مطلوبة بينما يتم فى نفس الوقت التحكم فى

التداخل الذى يحدث بين الخلايا المجاورة .هذا هو الهدف من خوارزمية تحكم القدرة الجزئى والذى (3GPP) صدق مؤخرا عن طريق في هذه الأطروحة، تدرس قاعدة التحكم للحلقة المفتوحة بالتفصيل للحصول على أداء المرجعية ، ومن ثم يتم اقتراح جميع التقنيات وذلك بهدف تحسينه .ويتم تنفيذ جميع التقنيات عن طريق استخدام نظام محاكاة ثابت. ويتم مقارنة النتيجة بين تقنيات مختلفة عن طريق النظر في مؤشرات الأداء الرئيسية مثل انقطاع خلية و الخلية الإنتاجية.

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Effect of α on SINR

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Outage Throughput vs Average Cell Throughput
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Outage Throughput vs Average Cell Throughput
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SINR distribution vs. cdf for FPC

SINR distribution vs. cdf for IPC

SINR distribution vs. cdf for GIPC

SINR distribution vs. cdf forC IPC

UE Transmitting power distribution vs. cdf for
FPC

UE Transmitting power distribution vs. cdf for IPC

UE Transmitting power distribution vs. cdf for
GIPC

UE Transmitting power distribution vs. cdf for
CIPC