

## **DUAL-CELL HSDPA OPERATION AND ITS PERFORMANCE EVALUATION**

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### **ABSTRACT**

One main target for the evolution of 3G mobile communication is to provide the possibility of significantly higher end-user data rates compared to what is achieved with the first releases of the 3G standards. This also refers to higher data rates over the entire cell area including users at the cell edge. 3GPP standards body has significantly enhanced the peak user throughput as part of Release-7 with features as MIMO and Higher Order Modulation (HOM) and this has helped to improve the average user throughput to some extent. One approach to increase the typical user experience consists in pooling the radio resources of two or more carriers in the same base station and enabling a collaborative operation on the lower radio layers (i.e. L2 layer) for a better resource utilization efficiency by dynamic radio resource management over multiple carriers. Within 3GPP such operation has been investigated under the work item “Dual-Cell HSDPA operation on adjacent carriers” (hereafter DC-HSDPA).

In this paper, a detailed description on DC-HSDPA is presented. DC-HSDPA operation has the purpose of enhancing the user experience throughout the whole cell range, in particular in outer area of the cell coverage (at the cell edge where MIMO cannot be operated with dual stream transmission). In terms of system performance, DC-HSDPA operation enables efficient and flexible spectrum asset utilization offering efficient inherent load balancing across the carriers.

**KEYWORDS:** DC-HSDPA, Carrier Aggregation, Resource Utilization Efficiency, Channel Quality Indicator, Quadrature Amplitude Modulation