

Integrated Common Radio Resource Management with Spectrum Aggregation over Non-Contiguous Frequency Bands

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Abstract:

This work proposes an Integrated Common Radio Resource Management (iCRRM). The iCRRM performs classic CRRM functionalities jointly with Spectrum Aggregation (SA), being able to switch users between non-contiguous frequency bands. The SA scheduling is obtained with an optimised General Multi-Band Scheduling algorithm with the aim of cell throughput maximisation. In particular, we investigate the dependence of the throughput on the cell coverage distance for the allocation of users over the 2 and 5 GHz bands for a single operator scenario under a constant average Signal to Interference-plus-Noise Ratio. For the performed evaluation, the same type of Radio Access Technology is considered for both frequency bands. The operator has the availability of a non-shared 2 GHz band and has access to part (or all) of a shared frequency band at 5 GHz. The performance gain, analysed in terms of data throughput, depends on the channel quality for each user in the considered bands which, in turn, is a function of the path loss, interference, noise, and the distance from the Base Station. An almost constant gain near 30% was obtained with the proposed optimal solution compared to a system where users are first allocated in one of the two bands and later not able to handover between the bands.