A Novel Dual-Size Interleaved Spot-Beam Architecture for Mobile Satellite Communications

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***Abstract*—In wireless communication systems, system capacity is mainly restricted to limited spectrum. In satellite systems, frequency reuse can be accomplished by using multiple beams. Spot beam technique is widely adopted in satellite systems, with similar frequency reuse factor as in terrestrial cellular systems, leading to a relatively low spectral efficiency. In this paper, a novel dual-size interleaved spot-beam architecture for mobile satellite communications is proposed. The system performance is analysed by calculating frequency reuse factor, uplink inter-beam interference and system throughput. The results suggest that the proposed spot-beam architecture has almost the same Signal to Interference plus Noise Ratio (SINR) performance as the traditional spot-beam architecture, and that the proposed architecture outperforms the traditional one in frequency reuse and system throughput, making better utilization of frequency spectrum.**

***Keyword*—Dual-size, frequency reuse, multi-beam, spot-beam architecture, satellite communication**

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