A Novel Technique to improve the Performance of Wireless Sensor Network using Adaptive Antennas and High-Altitude Platform Communications

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Abstract

In this paper, the performance of Wireless Sensor Networks (WSN) is improved using adaptive antenna technique and High-Altitude Platforms Systems (HAP). An adaptive concentric circular array (ACCA) is proposed to improve the communications link between sink and sensor nodes. The system is first demonstrated for several scenarios including different cell sizes at a HAP height of 20 km and the quality of link in terms of the ratio of bit energy to noise power is demonstrated where it shows the capability and reliability of building HAP-WSN despite of the long distance between ground sensors and HAP sink. The proposed ACCA technique provides a power gain profile that both increases the power to and from sensor nodes as well as it reduces the out-of-cell radiation to other HAP-WSN areas.

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Index Terms

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