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Exploiting UAV as NOMA based Relay for Coverage Extension

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Abstract
Unmanned aerial vehicles (UAVs) aided communication has acquired research interest in many civilian and military applications. The use of UAV as base stations and as aerial relays to improve coverage of existing cellular networks is prevalent in current literature. Along with this, a few studies have proposed the use of non-orthogonal multiple access (NOMA) in UAV communications. In this paper, we propose a network where a ground user and an aerial UAV relay is accessed using NOMA, where the UAV acts as decode-and-forward (DF) relay to extend the coverage of source. The performance of the proposed model is shown by evaluating outage behaviour for different transmit power and fading environments with Monte Carlo simulations. System throughput of proposed network appears to be better than orthogonal multiple access (OMA) based equivalent network. The results show that with an adequate height of the UAV NOMA based relay, quality of service (QoS) of cell edge user is satisfactory. © 2019 IEEE.

Author Keywords
nonorthogonal multiple access (NOMA); relaying; Unmanned aerial vehicles (UAVs)

Index Keywords
Antennas, Intelligent systems, Military applications, Military vehicles, Monte Carlo methods, Quality of service, Security of data; Aided communication, Coverage extension, Decode and forward, Equivalent network, Fading environment, Multiple access, relaying, Research interests; Unmanned aerial vehicles (UAV)

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