

Performance Analysis of DSSS-PDMA with SIC in GEO Satellite-Terrestrial Uplink Networks

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Abstract—There is a growing trend to utilize satellite networks for the construction of 5G and Beyond 5G high-capacity systems. The power division scheme used in non-orthogonal multiple access (NOMA), which is a key technology for terrestrial networks, can contribute to improving the system capacity of satellite networks. In this paper, we propose a direct sequence spread spectrum-power level division multiple access (DSSS-PDMA) scheme that combines non-orthogonal PDMA with DSSS technology to mitigate the depletion of communication resources and interference to terrestrial terminals. Finally, simulation results with ETS-9 as the high throughput satellite (HTS) and active electronically scanned array (AESA) antenna as the earth station validate the effectiveness and superiority of the proposed schemes as compared with several existing schemes.

Keyword—Power level division multiple access, Direct sequence spread spectrum, Successive interference cancellation, Satellite-terrestrial communication, Active electronically scanned array

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