

signal to the destination user at the same time. However, the performance of the conventional scheme is degraded if the distance between BBS and the destination user and CBS and the destination user is increased and the communication environment is bad. So, this paper proposes the adaptive cooperative transmission scheme with relay according to the destination user location. As a result, the improved performance is provided by proposed scheme since the relay transmits the additional signal by short transmission distance. Also, the application of the suitable transmission scheme considering two locations can obtain good performance. Therefore, the proposed scheme can do reliable communication with relay in the attenuation environment.

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References

1. S.H. Jung, D.H. Park, H.K. Song: Cooperative Beamforming Scheme Using MIMO Antenna Array in LTE-A System. *Journal of Electromagnetic Waves and Applications*, vol.29, no.9, pp.1218-1227 (2015)
2. S.B. Choi, E.H. Lee, J.I. Baik, Y.H. You, H.K. Song: Cooperative Communication Using the DF Protocol in the Hierarchical Modulation. *IEICE Transactions Fundamentals*, vol. E98-A, no.9, pp. 1990--1994 (2015)
3. Karkhanechi, H. M., Levy, B.C.: Spatial Multiplexing and Diversity Gain in OFDM-based MIMO Systems," *IEEE Topical Conference on Wireless Communication Technology*, pp299-301 (2003)
4. Alamouti, S. M.: A Simple Transmitter Diversity Scheme for Wireless Communications. *IEEE J. Select. Areas Commun.*, vol. 16, no. 8, pp. 1451–1458 (1998)
5. H.J. Shin, J.I. Baik, H.K. Song: An Efficient Strategy for Relay Selection in Wireless Communication. *IEICE Transactions Fundamentals*, vol. E98-A, no.2, pp. 740--744 (2015)