Power Allocation and Relay Selection in Amplify-and-Forward Relaying

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***Abstract*—Multihop communication is considered to be a standard in next generation cellular networks. There are several relaying schemes, Decode-and-forward(DF) and Amplify-and-Forward(AF) being the popular ones. In DF scheme, the relay decodes the message from the source, re- encodes and transmits it to the destination node whereas in AF the relay amplifies the received signal and transmits to the destination node. Relay selection and optimal power allocation are the two important aspects in either scheme. In this work, we look at these two problems in 2- hop communication network in which relays employ AF scheme. To make the power allocation problem well-defined we prove that rate/capacity is a concave function of both source and relay powers. Once concavity is established, we can find the optimal relay and source powers. However, when there are multiple relays the power allocation might interfere with relay selection. We show that this is indeed the case and discuss the conditions under which a relay switch over can take place.**

I. Introduction

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II. Amplify-and-Forward Relaying

III. Source power and Relay selection

IV. Future Work

V. Conclusion

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References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.