



Journal Menu

- [Abstracting and Indexing](#)
- [Aims and Scope](#)
- [Article Processing Charges](#)
- [Articles in Press](#)
- [Author Guidelines](#)
- [Bibliographic Information](#)
- [Contact Information](#)
- [Conference Sponsorships](#)
- [Editorial Board](#)
- [Editorial Workflow](#)
- [Reviewers Acknowledgment](#)
- [Subscription Information](#)

[Call for Proposals for
Special Issues](#)

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Research Letter

Slow Adaptive M-QAM under Third-Party Received Signal Constraints in Shadowing Environments

Yan Li^{1,2} and Shalinee Kishore¹

¹Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, PA 18015, USA

²InterDigital Inc., King of Prussia, PA 19406, USA

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[Abstract](#)

[Full-Text PDF](#)

[Full-Text HTML](#)

[Linked References](#)

[How to Cite this Article](#)

Abstract

Motivated by recent interest in dynamic spectrum sharing between primary and secondary spectrum users, we investigate slow adaptive quadrature amplitude modulation (QAM) under third-party received power constraints. The optimal rate and power adaptation schemes are derived to maximize the average spectral efficiency (SE) for the secondary users. Additionally, closed-form expressions of the achievable SE are presented for correlated lognormal shadow fading environments. Our analytical and numerical results underscore the importance of exploiting shadowing correlation in the proposed adaptive schemes.