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Long distance quantum communication using continuous variable encoding LINSHU LI, VICTOR V. ALBERT, Yale University, MARIOS MICHAEL, Cambridge University, SRERAMAN MURALIDHARAN, CHANGLING ZOU, LIANG JIANG, Yale University — Quantum communication enables faithful quantum state transfer between different parties and protocols for cryptographic purposes. However, quantum communication over long distances (>1000km) remains challenging due to optical channel attenuation. This calls for investigation on developing novel encoding schemes that correct photon loss errors efficiently. In this talk, we introduce the generalization of multi-component Schrödinger cat states [1] and propose to encode quantum information in these cat states for ultrafast quantum repeaters [2,3]. We detail the quantum error correction procedures at each repeater station and characterize the performance of this novel encoding scheme given practical imperfections, such as coupling loss. A comparison with other quantum error correcting codes for bosonic modes will be discussed. [1] M. Mirrahimi, Z. Leghtas, V. V. Albert, S. Touzard, R. J. Schoelkopf, L. Jiang, and M. H. Devoret, New J. Phys. 16, 045014 (2014). [2] S. Muralidharan, J. Kim, N. Lütkenhaus, M. D. Lukin, and L. Jiang, Phys. Rev. Lett. 112, 250501 (2014). [3] S. Muralidharan, L. Li, J. Kim, N. Lütkenhaus, M. D. Lukin, and L. Jiang, arXiv:1509.08435

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