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Correlated Errors in the Surface Code¹ DANIEL LOPEZ, Universidade Federal do ABC - Brazil, E. R. MUCCILOLO, University of Central Florida, E. NOVAIS, Universidade Federal do ABC - Brazil — A milestone step into the development of quantum information technology would be the ability to design and operate a reliable quantum memory. The greatest obstacle to create such a device has been decoherence due to the unavoidable interaction between the quantum system and its environment. Quantum Error Correction is therefore an essential ingredient to any quantum computing information device. A great deal of attention has been given to surface codes, since it has very good scaling properties. In this seminar, we discuss the time evolution of a qubit encoded in the logical basis of a surface code. The system is interacting with a bosonic environment at zero temperature. Our results show how much spatial and time correlations can be detrimental to the efficiency of the code.

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