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Nader Motee, Bethlehem, PA 18015, and **Qiyu Sun*** (qiyu.sun@ucf.edu), Department of Mathematics, Orlando, FL 32816. *Localized Stability Analysis on Sparse Proximity Graphs*. Preliminary report.

In this talk, we will discuss a finite or infinite dimensional class of spatially distributed linear systems with Hermitian and sparse state matrices. We show that exponential stability of this class of systems can be inferred in a decentralized and spatially localized manner. We proposed some necessary and sufficient stability certificates which are independent of the dimension of the entire system and only require localized knowledge about the state matrix of the system. As an application, we obtain several sufficient conditions that allow us to adjust strength of existing couplings in a network in order to sparsify or grow a network, while ensuring global stability. (Received August 25, 2018)