Excitons in QED$_3$ and spin response in a phase-fluctuating $d$-wave superconductor$^1$ BABAK SERADJEH$^2$, University of British Columbia, IGOR HERBUT, Simon Fraser University — We study the particle-hole exciton mode in the QED$_3$ theory of a phase-fluctuating $d$-wave superconductor in ladder approximation. We derive a Schrödinger-like equation for the exciton bound state and determine the conditions for its existence. We find the dispersion of this mode below the particle-hole continuum and compare our results with the resonance observed in neutron scattering measurements in cuprates. See http://www.physics.ubc.ca/~babak/march07/ for a list of references on this work.

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$^2$For references, see http://www.physics.ubc.ca/~babak/march07/