Generalized Fidelity Susceptibilities as Applied to the $J_1 - J_2$ **Heisenberg Chain** MISCHA THESBERG, ERIK S. SORENSEN, McMaster University — In this talk slightly generalized quantum fidelity susceptibilities for the antiferromagnetic Heisenberg $J_1 - J_2$ chain will be introduced. The differential change in these fidelities differ from the typical fidelity in that they are measured with respect to a term other than the one used for driving the system towards a quantum phase transition. We study three fidelity susceptibilities; χ_ρ, χ_D and χ_{AF}, which are related to the spin stiffness, the dimer order and antiferromagnetic order, respectively. I will discuss how these quantities can accurately identify the quantum critical point at $J_2{=}0.241167J_1$ in this model. This phase transition, being in the Berezinskii-Kosterlitz-Thouless universality class, is controlled by a marginal operator and is therefore particularly difficult to observe. In addition more recent work on the anisotropic Heisenberg triangular model will be discussed.

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