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Momentum dependent light scattering in insulating cuprates F. VERNAY, M. J. P. GINGRAS, T. P. DEVEREAUX, Department of Physics and Astronomy, University of Waterloo, Ontario, Canada — We investigate the problem of inelastic x-ray scattering in the spin- $\frac{1}{2}$ Heisenberg model on the square lattice. We first derive a momentum dependent scattering operator for the A_{1g} and B_{1g} polarization geometries. On the basis of a spin-wave analysis, including magnon-magnon interactions and exact-diagonalizations, we determine the qualitative shape of the spectra. We argue that our results may be relevant to interpret inelastic x-ray scattering experiments in the antiferromagnetic state of copper oxide materials.

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