Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

**Raman scattering for the Heisenberg S=1/2 antiferromagnet** NATALIA PERKINS, Physics Department, University of Wisconsin, Madison, WOLFRAM BRENIG, Institute fur Theoretische Physik, TU Braunschweig, Germany — We study the full Raman intensity for the Heisenberg $S = 1/2$ antiferromagnet on the triangular lattice by simultaneously considering the effects of the renormalization of the spectrum by $1/S$ corrections, and the final state magnon-magnon interactions. The analysis of the Raman intensity without final state interactions shows, that it has two peaks, corresponding to two maxima of the bare magnon spectrum $E_k$. Then we calculate Raman intensity with the renormalized spectrum. We obtain that at the energy at which the renormalized dispersion has a plateau, and, therefore, density of states is large, the Raman intensity is strongly enhanced. We also derive explicit expressions for the vertex functions to order $1/S$, and calculate Raman intensity including $1/S$ self-energy and the vertex corrections on equal footing. The vertex corrections is calculated by a summation of ladder diagrams with magnon-magnon interactions. Once interactions are included, the peak smears out and shifts to lower energies.

Natalia Perkins
Physics Department, University of Wisconsin, Madison

Date submitted: 29 Nov 2007 Electronic form version 1.4