Magnetic interactions and spin waves in LiCu$_2$O$_2$ A. ZHELUDEV, T. MASUDA, Condensed Matter Sciences Division, Oak Ridge National Laboratory, B. ROESSLI, Laboratory for Neutron Scattering, ETH Zurich and Paul Scherrer Institute, A. BUSH, Moscow Institute of Radiotechnics, Electronics and Automation, M. MARKINA, A. VASILIEV, Low Temperature Physics Department, Moscow State University — Magnetic excitations in the spiral magnet LiCu$_2$O$_2$ are studied by thermal and cold neutron scattering techniques. The spin models are discussed based on coupled ladder model including four exchange parameters; rung interaction $J_1$, nearest neighbor inchain interaction $J_2$, next-nearest neighbor inchain interaction $J_4$, and inter-ladder coupling $J_\perp$. The magnetic dispersion suggests that antiferromagnetic $J_1$, ferromagnetic $J_2$, and antiferromagnetic $J_4$ induce frustration in this compound. Weak inter-ladder coupling was also observed. This work was carried out under DOE Contract No. DE-AC05-00OR22725.