

The content of this work is a measurement of spin waves in triangular lattice antiferromagnets. Single crystals of  $\text{Na}_2\text{BaMn}(\text{PO}_4)_2$  were successfully grown and the magnetic properties of this system were initially studied by the specific heat with applied magnetic field along  $ab$  and  $c$  axis. These measurements revealed a rich magnetic phase diagram with a new phase, that might be a highly exotic Vortex crystal phase. Complementary inelastic neutron scattering studies of this system could be performed only thanks to the development and improvement of the new experimental technique called Automatic Laue Sample Aligner (ALSA). After several tests and improvements, we used this device to automatically coalign hundreds of milligram crystals to form a large enough sample. Such an advanced approach led to the impressive mosaicity spread around  $2^\circ$  and thus to a very sensitive inelastic neutron study performed on IN12 at Institute Laue-Langevin. It allowed us to determine the propagation vector in the ground state at 55 mK as  $\mathbf{k} = (1/3, 1/3, \pm 0.181(4))$ . Additionally, spin waves were measured in a fully polarized state in a magnetic field of 10 T revealing magnon dispersion in  $\text{Na}_2\text{BaMn}(\text{PO}_4)_2$ .