

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Ultrasonic Study of Critical Behavior in the Magnetic Phase Diagram of CsNiCl₃¹ G. QUIRION, X. HAN, M. L. PLUMER, Department of Physics, Memorial University, St.-John's, NL, Canada, M. POIRIER, Department of Physics, Sherbrooke University, Sherbrooke, Qc, Canada — It is now well established that many quasi-one-dimensional frustrated triangular antiferromagnets of the ABX₃ family exhibit exotic magnetic phase diagrams with new types of multicritical points [1]. Nevertheless, investigations into the nature of some phase boundaries remain controversial. While some theoretical and numerical studies suggest new chiral universality classes, others conclude these transitions are weakly first order [2]. Results are presented here of a systematic investigation of the critical behavior associated with the magnetic field - temperature phase diagram of CsNiCl₃ using high resolution ultrasonic measurements of the elastic constants, along with analysis based on a Landau-type model of magnetoelastic coupling [3]. In particular, we will show how it is possible to obtain very reliable values for the critical exponents associated with the transitions to elliptical and the spin-flop ordered states. Exponent estimates very close to the multicritical point are also presented. [1] M.L. Plumer et al, in *Magnetic Systems with Competing Interactions*, Ed. H.T. Diep (World Scientific, Singapore, 1994). [2] A. Peles et al, *Phys. Rev. B* 69, 220408 (R) (2004). [3] G. Quirion, T. Taylor and M. Poirier, *Phys. Rev. B* 72, 094403 (2005).

¹Supported by grants from NSERC and CFI

G. Quirion
Department of Physics, Memorial University, St.-John's, NL

Date submitted: 29 Nov 2005

Electronic form version 1.4