

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Neutron scattering studies of a bond-disordered $S = 1$ quantum spin liquid¹ KIRILL POVAROV, ERIK WULF, DAN HÜVONEN², SEVERIAN GVASALIYA, Neutron Scattering and Magnetism Group, ETH Zürich, Switzerland, ERIC RESSOUCHE, SPSMS-MDN, UMR-E CEA/UJF-Grenoble, France, JACQUES OLLIVIER, Institut Laue-Langevin, Grenoble, France, ARMANDO PADUAN-FILHO, High Magnetic Field Laboratory, University of São Paulo, Brazil, ANDREY ZHELUDEV, Neutron Scattering and Magnetism Group, ETH Zürich, Switzerland — We report the results of the neutron scattering studies of a bond-disordered modification of a well-known gapped $S = 1$ antiferromagnetic quantum system $\text{NiCl}_2\cdot 4\text{SC}(\text{NH}_2)_2$ (commonly referred to as DTN). The focus of the study is a zero-field spin-liquid phase of a compound with 6% of Cl to Br substitution. Inelastic neutron time-of-flight measurements at a temperature of 60 mK were employed to map the magnetic excitation spectrum over the whole Brillouin zone with a high resolution. In addition, we have also investigated the critical properties of the field-induced phase transition in DTN specimen with various concentration of Br by means of neutron diffraction [1]. We compare these experimental results to the bulk measurements on DTN with similar levels of Cl/Br substitution and recent theoretical predictions for disordered quantum magnets.

[1] E. Wulf, D. Hüvonen et al.; Phys. Rev. B **88**, 174418 (2013)

¹This work was partially supported by the Swiss National Fund.

²Present address: National Institute of Chemical Physics and Biophysics, Tallinn, Estonia

Kirill Povarov
NSM Group, ETH Zürich

Date submitted: 04 Nov 2014

Electronic form version 1.4