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^{31}P-NMR Study of the Effect of Pressure on the Magnetic Properties of the 2d Frustrated Square-Lattice Compound BaCdVO$(PO_4)_2$ at Low Temperatures[1] BEAS ROY, Ames Laboratory, Department of Physics and Astronomy, Iowa State University, RAMESH NATH, Indian Institute of Science Education and Research, Thiruvananthapuram, DAVID C. JOHNSTON, YUJI FURUKAWA, Ames Laboratory, Department of Physics and Astronomy, Iowa State University — BaCdVO$(PO_4)_2$ is a spin $S = 1/2$ frustrated square-lattice compound with a nearest-neighbor exchange coupling $J_1 = -3.62$ K and a next-nearest-neighbor exchange coupling $J_2 = 3.18$ K yielding $|J_2/J_1| = 0.88$. A transition to an antiferromagnetic (AFM) ground state occurs below a temperature $T_N = 1.0$ K under ambient pressure p. Based on the J_2/J_1 ratio, the system is located close to the disordered ground state ("nematic state") regime of the phase diagram. We carried out ^{31}P-NMR measurements under high p, ranging from 0.74 GPa to 1.88 GPa, and at low temperatures T down to 100 mK, to investigate the effects of p on the magnetic properties of the system. With increasing p, the T_N does not change much, but the magnetization saturation field H_S is significantly suppressed from $H_S = 4.2$ T at ambient p to $H_S = 0.55$ T at $p = 1.88$ GPa. Our ^{31}P-NMR spectra and spin-lattice relaxation rate $(1/T_1)$ data establish the first H–p–T phase diagram for this system.

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