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Using applied magnetic fields to induce unconventional magnetic order in the frustrated quantum magnet, clinoatacamite, $\text{Cu}_2\text{Cl}(\text{OH})_3$.

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The natural mineral clinoatacamite, $[\text{Cu}_2\text{Cl}(\text{OH})_3]$, exhibits low-temperature, frustrated magnetic behaviour where competing interactions are responsible for novel magnetic properties. Attempts to establish the magnetic phases in this material have been undertaken and an unconventional applied field ($H\parallel b$) phase diagram has been revealed [1]. Two critical transition temperatures at zero field have been identified with long range antiferromagnetic (AFM) order for $T_1 < 6\text{K}$, and paramagnetic behaviour for $T_2 > 18\text{K}$. In-field magnetisation data collected between 6-18K reveal three distinct phases for $H\parallel b$ which are not completely understood. Until now, the phase diagram of clinoatacamite has not been probed for $H\parallel a$ or $H\parallel c$. We will present neutron scattering measurements of single crystal clinoatacamite in applied fields up to 10T. With these measurements we have mapped out the phase diagram of the antiferromagnetic structure for $H\parallel a^*$.

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