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Magnetic Properties of $LiFePO_4$ under Hydrostatic Pressure

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$LiFePO_4$ (LFPO) is an archetypical and well-known cathode material **[1]** for rechargeable Li-ion batteries. However, its quasi-one-dimensional (Q1D) structure (see Figure) along with the Fe ions, LFPO also displays interesting low-temperature magnetic properties **[2]**. At ambient pressure LFPO display an antiferromagnetic (AFM) spin order below $T_N = 53$ K and neutron scattering **[3-5]** have characterized that LFPO orders in a canted AFM ground state below T_N. Our team has previously utilized muon spin rotation (μ^+SR) to investigate both magnetic order as well as Li-ion diffusion in LFPO **[6]** as well as nano-structured LFPO **[7,8]** and related compounds **[9-11]**. In this initial study we make use of high-pressure μ^+SR to investigate effects on the low-T magnetic order. We find a clear decrease in T_N at $p = 20$ kbar and we can estimate that a complete suppression of magnetic order should appear around $p_c \approx 300$ kbar.

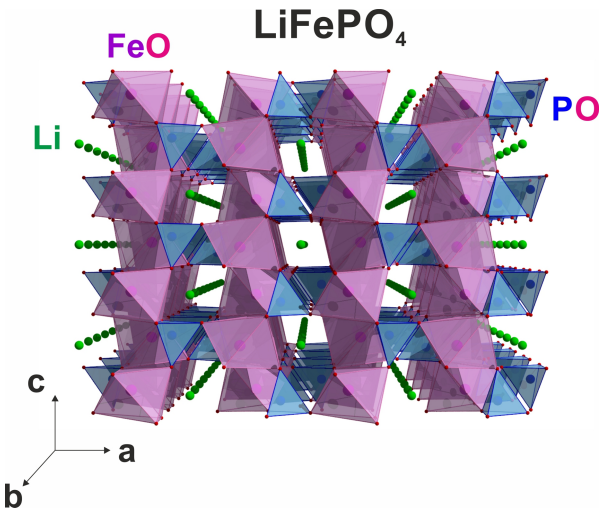

Figure 1:

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