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^{139}La NMR in $La_4Ni_3O_8$: a possible analog to the cuprate high temperature superconductors NICHOLAS APROBERTS-WARREN, University of California at Davis, VIKTOR POLTAVETS, MARTHA GREENBLATT, Rutgers University, ADAM DIOGUARDI, ABBY SHOCKLEY, NICHOLAS CURRO, University of California at Davis — The Ni^{1+}/Ni^{2+} states in the nickelates have identical electronic configurations as Cu^{2+}/Cu^{3+} in the high temperature superconducting cuprates ($3d^9/3d^8$), and may exhibit similar properties. However, the Ni^{1+} state is rare and cannot be easily stabilized. Recently, Martha Greenblatt and collaborators at Rutgers University have succeeded in growing a family of such compounds, $Ln_{n+1}Ni_nO_{2n+2}$ with a layered structure similar to the cuprates. The $La_4Ni_3O_8$ compound is particularly interesting as it undergoes an antiferromagnetic transition at $T_N = 100$ K. We have done La NMR on powder samples to investigate the nature of this phase. Our spin lattice relaxation rate measurements clearly reveal a second order electronic phase transition similar to that observed in other antiferromagnets. Although we found clear signatures of changes to the spectra below T_N, we are unable to assign these changes to the presence of an internal field from the antiferromagnetic structure, or changes to the electric field gradient at the La site.

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