

Abstract Submitted  
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**Optical hyperpolarization and inductive readout of  $^{31}\text{P}$  donor nuclei in natural abundance single crystal  $^{29}\text{Si}$**  THOMAS ALEXANDER, HOLGER HAAS, RAHUL DESHPANDE, Institute for Quantum Computing, University of Waterloo , PATRYK GUMANN, IBM Research , DAVID CORY, Institute for Quantum Computing, University of Waterloo — We optically polarize and inductively detect  $^{31}\text{P}$  donor nuclei in single crystal silicon at high magnetic fields ( $6.7\text{T}$ ). Samples include both natural abundance  $^{29}\text{Si}$  and an isotopically purified  $^{28}\text{Si}$  sample. We observe dipolar order in the  $^{29}\text{Si}$  nuclear spins through a spin-locking measurement. This provides a means of characterizing spin transport in the vicinity of the  $^{31}\text{P}$  donors.

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