**SNO+ Readout Electronics Upgrades** RICHARD BONVENTRE, TIMOTHY SHOKAIR, ROBERT KNAPIK, University of Pennsylvania, SNO+ COLLABORATION — The SNO+ experiment is designed to explore several topics in neutrino physics including neutrinoless double beta decay, reactor antineutrinos, and low energy solar neutrinos. SNO+ uses the existing Sudbury Neutrino Observatory (SNO) detector, with the heavy water target replaced with liquid scintillator. The new target requires an upgrade to the command and control electronics to handle the higher rates expected with scintillation light as compared to Cherenkov light. The readout electronics have been upgraded to autonomously push data to a central data acquisition computer over ethernet from each of the 19 front end crates. The autonomous readout is achieved with a field programmable gate array (FPGA) with an embedded processor. Inside the FPGA fabric a state machine is configured to pull data across the VME-like bus of each crate. A small C program, making use of the open source Light Weight IP (LWIP) libraries, is run directly on the hardware (with no operating system) to push the data via TCP/IP. The hybrid combination of 'high-level' C code and a 'low-level' VHDL state machine is a cost effective and flexible solution for reading out individual front end crates.

Richard Bonventre
University of Pennsylvania

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