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The Design and Monitoring of the Timing and Synchronization System at the NOvA Experiment JUSTIN VASEL, Indiana Univ - Bloomington, NOVA COLLABORATION — NOvA is an accelerator-based, long-baseline neutrino oscillation experiment designed to probe the mass hierarchy and mixing structure of the neutrino sector. The experiment consists of a near detector at Fermilab and a far detector 810 km away in northern Minnesota positioned to receive neutrinos from Fermilab's NuMI beam. A GPS-based timing system has been designed and built to synchronize the 344,064 far detector readout elements and 20,192 near detector readout elements to an absolute timing precision that provides a channel-to-channel variation of less than 10 ns. This is done while simultaneously synchronizing the readout timing of the near and far detectors to the Fermilab accelerator complex to allow for the detection of the individual neutrino beam spills in each of the detectors. This presentation will outline the design of NOvA's timing system and discuss the means by which we monitor its performance to ensure the quality of the physics data being collected.

Justin Vasel
Indiana Univ - Bloomington

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