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Searching for Arbitrary Low-Energy Neutrino Transients with IceCube ROBERT CROSS, SEGEV BENZVI, Univ of Rochester — The IceCube Neutrino Observatory is designed to observe neutrinos above 10 GeV, but it is also sensitive to MeV neutrinos from Core Collapse Supernovae (CCSNe). SNDAQ, an online data acquisition and trigger system used in IceCube to observe CCSN neutrino bursts, is running with 99% uptime. The time windows currently used by the SNDAQ trigger are tuned to predictions of supernova simulations and the observed neutrino signal from SN1987A. However, CCSN models suffer from significant systematic uncertainties. To reduce the sensitivity of the trigger to these uncertainties, and to improve its sensitivity to a much wider range of transients, we have implemented a time-domain search using the Bayesian Blocks algorithm. The algorithm allows the data themselves to determine the timescale of excess counts above background. The Bayesian Blocks window makes the SNDAQ trigger more robust to uncertainties in CCSN neutrino emission models, while enabling general sub-threshold transient searches. We describe the implementation and performance of the Bayesian Blocks trigger and discuss improvements in the sensitivity of IceCube to supernovae in the Milky Way and its nearest satellite galaxies.

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