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Offline Neutrino Filtering using a Convolutional Neural Network at the Radio Neutrino Observatory Greenland

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Neutrino astronomy is a vibrant field of study in astrophysics, offering unique insights into the Universe's most energetic phenomena. The combination of a low cross section and zero electromagnetic charge ensure that a neutrino retains most information about its original source while traversing the universe. On the other hand, these low cross sections, combined with a reduced flux at higher energies, make the neutrino one of the most elusive particles to detect in the standard model. The Radio Neutrino Observatory in Greenland (RNO-G) aims to detect sporadic neutrino interactions in the Greenlandic ice sheet by means of electromagnetic signals in the radio frequency range, induced by the produced charged secondary particles. The low incoming neutrino flux forces the detector to set a low trigger threshold, leading to the measured data being overwhelmed by thermal noise fluctuations. Hence, a sophisticated and robust filter is needed to differentiate between neutrino-like signals and noise. In this talk we present the application of a convolutional neural network to identify noise events. The network employed uses real RNO-G data and simulated
neutrino signals to categorize measured data as noise or neutrino-like events

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