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The Radio Neutrino Observatory in Greenland: Performance and Prospect

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The Radio Neutrino Observatory - Greenland (RNO-G) is dedicated to search for ultra-high-energy (UHE) neutrinos with energies above 10 PeV by observing radio pulses from neutrino interactions in the Greenland ice shield. The detector will consist of 35 autonomously operating stations, each equipped with 24 antennas, deployed over an area of about 50 km². With an estimated sensitivity of $E^2\Phi \approx 10^{-8}$ GeV/cm²/s/sr in 5 years, RNO-G will allow to test a variety of cosmogenic neutrino flux models and has the potential to discover the first neutrino with an energy above 10 PeV. Its unique location in the northern hemisphere makes it complementary to any future or current UHE neutrinos observatories in Antarctica and will provide valuable information for multi-messenger searches in the northern sky.

In this talk, we will discuss the scientific potential of RNO-G to detect UHE neutrinos from a diffuse emission as well as from transient sources. We will present current efforts to implement a fast follow-up analysis to react on alerts from other observatories and contribute to multi-messenger campaigns. Finally, we will highlight first measurements from seven already installed stations.

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