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Simulation study for the future IceCube-Gen2 surface array

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The next generation of the IceCube Neutrino Observatory, IceCube-Gen2, will constitute a much larger detector, increasing the rate of high-energy neutrinos. IceCube-Gen2 will address the long-standing questions about astrophysical accelerators. The experiment will also include a surface air-shower detector which will allow for measurements of cosmic rays in the energy region where a transition between Galactic and extragalactic accelerators is expected. As a baseline design for the surface detector, we consider a surface array above the optical in-ice array consisting of the same type of stations used for the IceTop enhancement, i.e., scintillation detectors and radio antennas. In order to better understand the capabilities of such an array, we performed simulations of its response to air showers, including both detector types. We will show the results of this simulation study and discuss the prospects for the surface array of IceCube-Gen2.

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