

Abstract Submitted  
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**Evolving Antennas for Ultra-High Energy Neutrino Detection<sup>1</sup>**

ALEXANDER PATTON, Ohio State Univ - Columbus, GENETIS COLLABORATION — Evolutionary algorithms borrow from biology the concepts of mutation and selection to approach complex problems more efficiently than traditional techniques. The GENETIS project uses genetic algorithms to develop antenna designs with higher sensitivity to radio impulses from ultra-high energy neutrino interactions than current designs. We attempt to improve on antenna designs used in current experiments, using geometric constraints imposed by a narrow hole in deep ice. By integrating the XFDTD finite-difference time domain modeling program with simulations of neutrino experiments, we are able to assign a fitness score that is based on neutrino sensitivities. We will report on advancements to the algorithm, steps taken to improve the software we use, the latest results from our evolutions, as well as our roadmap for manufacturing.

<sup>1</sup>2020 Ohio State University Alumni Grants for Graduate Research and Scholarship Award Winner

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