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Enhancing the Sensitivity of HAWC to sub-Tev Transients IAN WISHER[1], University of Wisconsin - Madison, HAWC COLLABORATION — The High Altitude Water Cherenkov (HAWC) Observatory, currently being built 4100 meters above sea level near Pico de Orizaba, Mexico, is well-suited for observing transient phenomena above 1 TeV due to its large field of view (2 sr) and high uptime ($\sim$100%). However, sub-TeV transient events are also of physical interest due to the overlap in energy with satellite experiments such as the Fermi gamma-ray space telescope. This presents a challenge since the sub-TeV primary particles observed with HAWC tend to be difficult to distinguish from noise. To address this problem, we propose a method in which particle arrival directions are fit to triplets of triggered PMTs in a short sliding trigger window (100 ns). The resulting arrival directions are then summed in a coarsely binned significance map of the sky with a time window of one to several seconds. This algorithm is simple enough to be applied online, and can localize the positions of transient sources to within 8 degrees. We run the method over HAWC30 detector data to estimate the noise rate and use simulated events to calculate the sensitivity to transients.

[1]On behalf of HAWC Collaboration

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