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Investigating Millimeter-Bright AGN as IceCube's Astrophysical Neutrino Sources

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In the last decade, the IceCube South Pole Neutrino Observatory has observed an astrophysical neutrino flux with unexpected implications for the environments of extragalactic accelerators. The discovery of the high-energy, transient neutrino source TXS 0506+056 has drawn further attention to blazars, and the traditional correlation of their activity with gamma-ray emission. However, gamma-ray correlated analyses have not found a significant population of contributing sources, and the majority of astrophysical diffuse emission remains unassociated. More recently, the opacity of such environments to high-energy photons has been highlighted. Here, we discuss millimeter-wavelength observations of variable AGN as an alternative tracer for neutrino activity. New light curves representing over two hundred of the brightest AGN observed by the Atacama Cosmology Telescope are considered. The relation of synchrotron emission at these wavelengths to neutrino production is explored, with additional focus on the time-varying intensity and spectrum of TXS 0506+056. Results from a first correlation with IceCube data are presented, investigating emission from this millimeter-bright source class and from individual objects.

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