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Searching for high-energy neutrino emission from hard X-ray AGN with IceCube

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AGN are powerful sources that are believed to be capable of accelerating particles to high energies. In environments with gas or photon targets, cosmic-ray interactions transpire leading to the production of pionic gamma rays and neutrinos. Since the AGN environment is rich in gas, dust and photons, they are promising candidate sources of high-energy astrophysical neutrinos. While the neutrinos manage to escape, the gamma rays may further interact and cascade down to hard X-rays in environments with sufficiently large photon or gas targets. This is consistent with the detection of a neutrino flux from NGC 1068 by IceCube that is well above the observed gamma-ray flux. We have used 12 years of IceCube data to perform a stacked search and a point source search for high-energy neutrino emission from hard X-ray AGN sampled from Swift-BAT Spectroscopic Survey (BASS). In this talk I will describe the search and present the results, including upper limits of high-energy neutrino emission from different populations of AGN and a measurement of a 2.9σ excess from the sefert galaxy NGC 4151.

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