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Multimessenger test of hadronic model for Fermi bubbles

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The Fermi bubbles at the Galactic center have been imaged in sub-TeV gamma rays by the Fermi-Large Area Telescope and might have been detected in 0.3-1 PeV neutrinos by the IceCube Neutrino Observatory. A hadronic model, involving cosmic-ray interactions in the bubble volumes, can account for both gamma-ray and neutrino observations but is far from being confirmed due to low neutrino statistics. We present a possibility to test the hadronic model using 0.1-100 TeV gamma-ray observations by the High Altitude Water Cherenkov (HAWC) detector which has recently started its operation. HAWC will either substantiate hadronic model, establishing Fermi bubbles as the first mulimessenger source, or will severely constrain hadronic origin of sub-TeV gamma rays.

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