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Abstract

We present a multi-epoch, multi-observatory X-ray analysis for 2FHL J1745.1-3035, a newly discovered very high energy Galactic source detected by the Fermi Large Area Telescope (LAT) located in close proximity to the Galactic Center (I=358.5319°; b=-0.7760°). The source shows a very hard gamma-ray photon index above 50 GeV, Gamma_gamma=1.2+-0.4, and is found to be a TeVemitter by the LAT. We conduct a joint XMM-Newton, Chandra and NuSTAR observing campaign, combining archival XMM-Newton observations, to study the X-ray spectral properties of 2FHL J1745.1-3035 over a time-span of over 20 years. The joint X-ray spectrum is best-fitted as a broken power law model with break energy E_b~7 keV: the source is very hard at energies below 10 keV, with photon index Gamma_1~0.6, and significantly softer in the higher energy range measured by NuSTAR with photon index Gamma_2~1.9. We also perform a spatially resolved X-ray analysis with Chandra, finding evidence for marginal extension (up to an angular size r~5 arcsec), a result that supports a compact pulsar wind nebula scenario. Based on the X-ray and gamma-ray properties, 2FHL J1745.1-3035 is a powerful pulsar wind nebula candidate. Given its nature as an extreme TeV emitter, further supported by the detection of a coincident TeV extended source HESS J1745-303, 2FHL J1745.1-3035 is an ideal candidate for a follow-up with the upcoming Cherenkov Telescope Array.

