

Modelling Spatial and Temporal Emission Properties of the Young Pulsar Wind Nebula Kes 75

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The H.E.S.S. Collaboration has firmly detected gamma-ray emission from HESS J1846-029, which is spatially coincident with Kes 75 (G29.7-0.3), one of the youngest composite supernova remnants in the Galaxy. This remnant contains the nebula of PSR J1846-0258, a glitching young pulsar with a particularly high spin-down luminosity that has manifested magnetar-like bursts in 2006. However, H.E.S.S. was not able to distinguish between shell and nebular emission. This source may also plausibly be associated with the HAWC-detected source 2HWC J1844-032. Recent *Chandra* observations revealed a rapid expansion of the embedded pulsar wind nebula over the past two decades and an X-ray flux decrease of 10% in 7 years. We apply a multi-zone spatio-temporal pulsar wind nebula model to the morphological and spectral data over several epochs, and find reasonable fits to the broadband radiation spectrum, X-ray surface brightness profile, expansion rate and photon spectral index in the X-ray energy range. Such spectral and morphological fitting constrains the model parameters, and may aid in clarifying the nature of the gamma-ray emission.

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