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Pulsars in Gamma-ray Astronomy with H.E.S.S.

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Pulsars are rapidly rotating neutron stars for which we detect pulsed emission. Pulsars have been detected from radio (more than 3000 sources detected) to gamma-rays (300 sources detected in 3PC).

In the last 2 decades, Imaging Atmospheric Cherenkov Telescopes (IACTs), such as H.E.S.S., MAGIC or VERITAS, have drastically enhanced the very high energy (VHE) astronomy, with several hundreds of sources detected. In the case of pulsars, four pulsars have been detected in the high energy domain. However, the major breakthrough was the discovery by H.E.S.S. of pulsed emission up to tens of TeV from the Vela pulsar. This detection opens the path towards TeV pulsar astronomy.

We will present new results from H.E.S.S.:

One of the major questions regarding pulsar emission models is whether the High Energy (HE) end of their spectra displays a tail extending beyond tens of GeV, as is the case for the Crab. We investigate this matter on both Vela and PSR B1706-44 through a joint-analysis using H.E.S.S. CT5 and Fermi-LAT data.

We report also on the detection of a new pulsar, PSR J1509-5850, by H.E.S.S. which displays a multi-TeV component, similar to Vela. However, its unexpectedly high TeV luminosity, as compared to the latter, opens even more the path towards TeV pulsar astronomy.

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