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Revealing time-resolved hadronic particle acceleration in the recurrent nova RS Ophiuchi with H.E.S.S.

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Recurrent Novae (RNe) are known to experience multiple eruptions in the form of thermonuclear explosions, due to the accumulation of material accreted by a white dwarf from a binary companion star.

The well known RN RS Ophiuchi (RS Oph) underwent its latest eruption in 2021 and triggered numerous follow-up observations world wide, including with the High Energy Stereoscopic System (H.E.S.S.), an array of Imaging Atmospheric Cherenkov Telescopes.

Non-thermal emission up to TeV energies is observed coincident with the Nova eruption within the first days and up to a month after the optical peak, establishing novae as Galactic transients reaching TeV energies.

Analysis and interpretation of the data identifies time-resolved acceleration of cosmic-rays, constraining models of particle energisation.

Combining the data taken by H.E.S.S. with concurrent observations taken by the Fermi-LAT, a similar temporal profile is observed, favouring a common origin to the emission.

In this talk, the detection of the non-thermal VHE emission from the RN RS Oph by H.E.S.S. will be presented and plausible models for the VHE emission discussed.

Summary

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