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H.E.S.S. observations of the unprecedented gamma-ray outburst of PKS 0903-57

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The blazar PKS 0903-57 underwent a huge gamma-ray outburst in early 2020, where the gamma-ray flux increased by more than an order of magnitude and the gamma-ray peaked energy increased by almost a factor 100. Follow-up observations with H.E.S.S. over 6 nights reveal a complex evolution of the gamma-ray component suggesting time- and energy-dependent acceleration and cooling processes. The X-ray domain is less active but still varies in flux by a factor of a few with a stable spectral index. The optical domain is hampered by the presence of a Galactic star merely 0.7" away from the radio position of PKS 0903-57. The total optical flux including the star and the blazar is variable within a factor of few, but modeling of the ground state and the flaring state suggests that the optical blazar flux may vary up to a factor 10. The characteristics of the source suggest that PKS 0903-57 is an FSRQ, even though modeling in both ground and flaring state requires low magnetic field values of less than 0.1G. The SEDs derived during the H.E.S.S. observations are reproduced with a leptonic model employing a variable magnetic field, as well as variable electron densities and minimum and maximum Lorentz factors.

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