

X-ray studies of the TeV-discovered supernova remnant HESS J1534-571

HESS J1534-571 is a supernova remnant that has been discovered in the H.E.S.S. Galactic plane survey. While a radio counterpart has been identified, a putative X-ray counterpart of the shell has eluded detection so far. We present XMM-Newton observations that have been obtained towards the brightest part of the TeV shell, which complement earlier Suzaku observations of other regions of the remnant. We can now conclusively show that HESS J1534-571 emits no X-ray synchrotron emission detectable at current X-ray satellite sensitivity level. The derived upper limit is compared to models of the relativistic electron population in the remnant. Given the size of the source and the shape of the gamma-ray spectrum, a leptonic origin for the gamma-rays cannot be excluded. We find evidence in the XMM-Newton data for line emission at 6.4 keV, in agreement with the Suzaku results from other regions. This emission may stem from the low-energy (\sim MeV) part of a relativistic proton population potentially confined in HESS J1534-571, which is unconstrained by the gamma-ray data.

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