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LHAASO measurements on very-high-energy gamma-ray emissions from the Sun

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A robust spectrum of gamma-ray emissions from solar disk reaches up to 200 GeV with no cutoff has been reported with Fermi-LAT. Recent results from HAWC also extended the energy up to 1 TeV. Many startling mysteries and open questions have shown up along with the unknown mechanism to understand its spectrum, time variability, and morphology. Any significant observation signals or a strong upper limit at high-energy range would provide valuable information on gamma-ray production from the Sun.

The Large High Altitude Air Shower Observatory (LHAASO) is a ground-based multi-targets observatory, located in Daocheng, Sichuan province, southwest China. The sub array in LHAASO, Water Cherenkov detector array (WCDA) and electromagnetic-muon particle detector array (KM2A), are dedicated for observing gamma-ray emissions from sub-TeV to hundreds TeV.

In this work, we report the excess gamma-ray event from the Sun with LHAASO-WCDA. A significant detection with statistical significance above 5 sigma was obtained at sub TeV. Physical implications of gamma-ray emission from the Sun will also discussed.

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