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Ultra-high-energy cosmic ray detection using next-generation prototypes of the Fluorescence detector Array of Single-pixel Telescopes (FAST) in both hemispheres

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Unraveling the origin and nature of ultra-high-energy cosmic rays (UHECRs) stands as an essential inquiry in astroparticle physics. Motivated by unprecedented observational capabilities, the Fluorescence detector Array of Single-pixel Telescopes (FAST) emerges as a promising next-generation, ground-based UHECR observatory.

The FAST employs a cost-effective array of cutting-edge fluorescence telescopes, equipped with four 200 mm diameter photomultiplier tubes positioned near the focal plane of a segmented 1.6 m diameter mirror. Currently, there are three prototypes in operation at the Telescope Array Experiment and one at the Pierre Auger Observatory. Together they enable to remotely observe UHECRs in both hemispheres using the same technology.

We present the recent findings from the FAST deployed in both hemispheres, including telescope calibrations, atmospheric monitoring, electronics upgrades, and the detection of ultra-high-energy cosmic rays, leading to stand-alone operations.

Alternate track

I read the instructions above

Yes

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