

Updates from the OVRO-LWA: Commissioning a Full-Duty-Cycle Radio-Only Cosmic Ray Detector

Friday 16 July 2021 19:18 (12 minutes)

The Owens Valley Radio Observatory- Long Wavelength Array (OVRO-LWA) in Eastern California is currently undergoing an expansion to 352 dual-polarization antennas and new signal processing infrastructure. The upgraded array will operate a full-duty-cycle cosmic ray detector simultaneously with a variety of radio astronomy observations. Expanding the methods introduced in a previous demonstration, this detector will operate on the radio signals alone to trigger data capture, identify cosmic rays in the presence of radio-frequency interference (RFI), and reconstruct the air shower properties: energy, direction, and X_{max} . When fully commissioned, the OVRO-LWA will observe thousands of cosmic rays per year at energies 10^{17} - 10^{18} eV and will constrain the cosmic ray composition across the cosmic ray spectrum's second knee with a typical X_{max} precision of $<20\text{g/cm}^2$ per air shower, thereby offering new composition information across the energy limits of Galactic accelerators. Commissioning for the OVRO-LWA is ongoing and is planned for completion in late 2021. I will present the trigger design, RFI flagging strategy, and a progress update from early commissioning.

Keywords

"radio; airshowers"

Collaboration

other Collaboration

Subcategory

Experimental Methods & Instrumentation

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Session Classification: Discussion

Track Classification: Scientific Field: CRI | Cosmic Ray Indirect