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# The First Observation of the Moon Shadow at an Average Energy of $7 \times 10^{17}$ eV with the Pierre Auger Observatory

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The interaction of cosmic rays with celestial bodies such as the Moon or the Sun produces a shadow in the arrival direction distribution of the cosmic rays reaching the Earth. Such deficits from an isotropic flux have been observed by astroparticle observatories below energies of $10^{15}$ eV. Above this energy, measurements were limited due to the low number of events as a result of the steeply falling cosmic-ray flux with energy. With more than 10.6 million events recorded during 20 years of operation of the Pierre Auger Observatory, we report the first observation of the Moon shadow at an average energy of $7 \times 10^{17}$ eV with a maximum significance above $3\sigma$. Using this deficit, we verify the accuracy of the Observatory's absolute pointing. Additionally, we present the results of a similar study on the Sun's shadow and discuss both measurements in the context of the angular resolution of the Observatory.

## Collaboration(s)

The Pierre Auger Collaboration

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