

Q30a      **Revisiting the Lunar MeV-GeV Gamma-Ray Spectrum: A New Window For Galactic MeV Cosmic Rays**

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The Moon is the closest celestial object. Detection of lunar gamma-rays by Fermi-LAT has allowed the GeV Galactic cosmic-ray spectrum to be measured. However, gamma-ray investigation of the Moon also has potential for the study of MeV Galactic cosmic rays with future coming MeV missions. Nuclear spallation and excitation interactions on the lunar surface would produce various gamma-ray lines, while inelastic hadronic collisions and bremsstrahlung could cause an intense MeV continuum. These signatures would help us to measure the MeV Galactic cosmic-ray spectrum. Taking into account the composition of the lunar surface, we performed spectral simulations using the latest Geant4 Monte Carlo Code. Our simulations are consistent with the observed Fermi-LAT lunar spectrum. They also show that the MeV cosmic-ray spectrum will be detectable with lunar measurements by the Compton Spectrometer and Imager (COSI). Based on our results, we report the future scientific prospects for lunar! observations with instruments such as COSI.