



Contribution ID: 254

Type: **Oral contribution**

## The spectrum of cosmic rays in the energy range $10^{16} - 10^{18}$ eV according to the Small Cherenkov Array in Yakutsk

*Monday, 3 August 2015 15:00 (15 minutes)*

The experimental data on the energy spectrum cosmic rays, obtained from Small Cherenkov Array in Yakutsk on the measurement of Cherenkov radiation in showers with energy  $10^{15} - 10^{18}$  eV are discussed. The data were obtained by means of continuous array operation since 1994. Found that the spectrum of the all particle in this energy region has a complex shape and cannot be described by a simple exponential function with a single slope indicator  $g$ . After the first kink at energy  $3 \cdot 10^{15}$  eV (knee), the spectrum becomes steeper at  $Dg = 0.4$  to energy  $< 2 \cdot 10^{16}$  eV, then part of the spectrum to  $> 8 \cdot 10^{16}$  eV becomes flat, the slope of the spectrum is  $g = 2.92 \pm 0.03$  and then again changes slope to  $Dg = 0.32 \pm 0.05$ , since about energy  $\sim 2 \cdot 10^{17}$  eV. The second kink in the spectrum observed at the Yakutsk EAS array at  $\sim 2 \cdot 10^{17}$  eV, or also called second knee is the significant result for space astrophysics of ultra-high cosmic rays. In this paper we discuss possible scenarios for spectrum formation of cosmic rays by the galactic sources to energies  $< 10^{17}$  eV, mainly supernovae remnants SNR and Metagalactic origins in the energy range  $10^{17} - 10^{18}$  eV. Most likely, that measurement of second knee is related with transitional region, galactic to extragalactic origin of cosmic rays.

### Collaboration

– not specified –

### Registration number following "ICRC2015-I"

273

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**Session Classification:** Parallel CR13 EX EAS

**Track Classification:** CR-EX