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Nuclear reactions related to very high and ultra-high energy cosmic rays

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The composition of very high-energy (VHE) and ultra-high energy (UHE) cosmic rays (CRs) was recently measured with higher statistics than before. The results implied that the composition of VHECRs becomes heavier up to $\sim 10^{17.2}$ eV and lighter above the energy, and the composition of UHECRs becomes lighter up to $\sim 10^{18.3}$ eV and heavier above the energy. The experimental evidence induces motivation to study the nuclear reactions of cosmic ray nuclei at the cosmic ray sources, in their propagation, and in the atmosphere of Earth. In this presentation, I will begin with an overview of the observations of very high and ultra-high energy cosmic rays and the nuclear reactions. After that, I will talk about our recent activities related to this topic.

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