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Anisotropy of UHECR: Conclusions for their Sources and the Cosmic Magnetic Fields

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Besides the measured energy spectrum and chemical composition of ultra-high energy cosmic rays (UHECR) arriving at the Earth, the anisotropy in their arrival directions offers information on the origin of UHECR, the chemical composition at their sources, and the propagation of UHECR through the cosmic magnetic fields. In this talk, simulation results for the anisotropy of UHECR that correspond to different assumptions on the properties of UHECR at their sources as well as on the structure of the galactic and extragalactic magnetic fields will be discussed. It will be shown that the properties of the sources of UHECR and the structure and strength of the cosmic magnetic fields have a strong effect on the anisotropy in the arrival directions of the UHECR. By comparison of the simulation results with published experimental data from the Telescope Array and the Pierre Auger Observatory, several possible hypotheses on the sources of UHECR and the cosmic magnetic fields will be excluded.