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The TAIGA - an hybrid detector complex in Tunka valley for astroparticle physics, cosmic ray physics and gamma-ray astronomy.

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The physical motivations and performance of the TAIGA (Tunka Advanced Instrument for cosmic ray physics and Gamma Astronomy) project are presented. The TAIGA observatory addresses ground-based gamma-ray astronomy at energies from a few TeV to several PeV, as well as cosmic ray physics from 100 TeV to several EeV and astroparticle physics. The pilot TAIGA-1 complex locates in the Tunka valley, ˜50 km West from the southern tip of the lake Baikal. It includes integrating air Cherenkov TAIGA-HiSCORE array with 120 wide-angle optical stations distributed over on area 1.1 square kilometer about and three the 4-m class Imaging Atmospheric Cherenkov Telescopes of the TAIGA-IACT array. The latter array has a shape of triangle with side lengths of about 300m, 400m and 500m. The integral sensitivity of the 1 km^2 TAIGA-1 detector is about $2,5\times10^{-13}$ TeV cm^{-2} sec^{-1} for detection of $E \geq 100$ TeV gamma-rays in 300 hours of source observations. The combination of the wide angle Cherenkov array and IACTs could offer a cost effective-way to build a really large (up to 10 km^2) array for very high energy gamma-ray astronomy. The reconstruction of a given EAS energy, incoming direction and the core position, based on the TAIGA-HiSCORE data, allows one to increase the distance between the relatively expensive IACTs up to 600-800 m. These, together with the surface and underground electron/Muon detectors will be used for selection of gamma-ray induced EAS. Present status of the project, together with the current array description and the first experimental results and plans for the future will be reported.

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