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Status and future perspective of the NA61/SHINE experiment

Content :

The NA61/SHINE detector is a large acceptance spectrometer with particle identification capabilities, where a beam of nuclei or hadrons collides with a fixed target at the CERN SPS facility. The NA61/SHINE project is the successor of the NA49 experiment, re-uses most of its equipment and software, and features important upgrades of both hardware and software. The broad physics program will provide new data of hadron production in interactions of light and medium size ions as well of protons and pions. The major goal of the heavy ion program is the exploration of the phase diagram of strongly interacting matter with a 2-dimensional scan in energy and size of the collision system. In particular NA61 will carry out a detailed study of the onset of deconfinement and search for signatures of the critical point. Precision measurements of proton-carbon and pion-carbon reactions are performed to improve the prediction of the neutrino flux for the T2K neutrino oscillation experiment and the reliability of air shower simulations for the Pierre Auger Observatory and KASCADE cosmic-ray projects. High-statistics p+p and p+Pb collision data will be collected to investigate nuclear modification effects at SPS energies.

The equipment and data acquisition system of the NA61/SHINE detector were upgraded for a tenfold increase of the speed of data taking as compared to NA49. A new projectile spectator detector is under construction which will allow a precise determination of the number of participants in ion collisions.

A pilot run of p+C interactions has been successfully completed in 2007 from which preliminary results are already used in the T2K neutrino experiment. Data taking with high statistics for T2K and cosmic ray experiments were completed this year. The energy/system size scan started with p+p reactions in 2009. Ion measurements are expected to start with B+C collisions in 2011. Ar+Ca and Xe+La collisions are planned for 2013/2014.

The status of the detector upgrades, as well as preliminary results from

both p+C and p+p collisions will be presented.

Collaboration :

NA61/SHINE collaboration

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