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The NA60+ experiment at the CERN SPS

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NA60+ is a new experiment designed to study the phase diagram of the strongly interacting matter at high baryochemical potential from 200 to 550 MeV at the CERN SPS. It is focused on precision studies of thermal dimuons, heavy quark and strangeness production in Pb–Pb collisions at center of mass energies ranging from 6 to 17 GeV.

The proposed experimental apparatus is composed of a vertex telescope located close to the target and a muon spectrometer located downstream of a hadron absorber. The vertex telescope will consist of several planes of ultra-thin, large area Monolithic Active Pixel sensors (MAPS) embedded in a dipole magnetic field. The muon spectrometer will utilize large area gaseous detectors for muon tracking and a toroidal magnet based on a new light-weight and general-purpose concept.

An ambitious physics program is foreseen, which includes the search for chiral symmetry restoration effects through the ρ - ω mixing, the study of the order of the phase transition at large baryochemical potential through the measurement of a caloric curve, the onset of the deconfinement through the measurement of J/ ψ suppression. Finally the measurement of the transport properties of the medium via open charm states and the study of hadrochemistry via detection of strange hadrons and hypernuclei is also part of the physics program.

A letter of intent was submitted at the end of 2022 and the goal is to start data taking in 2029.

This talk will focus on the experimental apparatus, including the technical aspects and the R&D status, as well as the physics program and its competitiveness and complementarity to other experiments.

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