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Search for the critical point of strongly interacting matter by NA61/SHINE at the CERN SPS

The existence and location of the QCD critical point are objects of both experimental and theoretical studies. The comprehensive data collected by NA61/SHINE at the CERN SPS during a two-dimensional scan in beam momentum (13A-150A GeV/c) and system size (p+p, p+Pb, Be+Be, Ar+Sc, Xe+La, Pb+Pb) allows for a systematic search for the critical point of strongly interacting matter through the analysis of the scaled factorial moments of the second and higher orders as a function of the phase space cell size in the transverse momentum plane.

The recent results will be presented for protons and negatively charged hadrons from Pb+Pb collisions at 13A ($\sqrt{s_{NN}} \approx$ 5.1 GeV), 30A GeV/c ($\sqrt{s_{NN}} \approx$ 7.6 GeV), and Ar+Sc at 13A, 19A, 30A, 40A, 75A, and 150A GeV/c beam momentum ($\sqrt{s_{NN}} \approx$ 5.1-16.8 GeV). No intermittency signal is observed, which seems to be in tension with the corresponding results of the STAR Collaboration at the Relativistic Heavy Ion Collider (RHIC).

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