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Exploring the hadronic phase of relativistic heavy-ion collisions with resonances in ALICE

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Hadronic resonances having short lifetimes are very useful to study the hadron-gas phase that characterizes the late-stage evolution of high energy nuclear collisions. Indeed, regeneration and rescattering processes occurring in the hadron gas modify the measured yields of hadronic resonances and can be studied by measuring resonance yields as a function of system size and by comparing to model predictions with and without hadronic interactions. Measurements of the differential yields of resonances with different lifetime, mass, quark content, and quantum numbers help in understanding particle production mechanisms, lifetime of the hadronic phase, strangeness production, parton energy loss, rapidity yield asymmetry and collective effects. With its excellent tracking and particle identification capabilities, the ALICE experiment has measured a comprehensive set of both meson and baryon resonances. We present recent results on resonance production in pp, p-Pb, Xe-Xe and Pb-Pb collisions at various centre-of-mass energies, highlighting new results on $\Sigma(1385)$ and $\Xi(1820)$, thus extending to higher mass the study of baryonic resonances at the LHC. The obtained results are used to study the system-size and collision-energy evolution of transverse momentum spectra, yields, mean transverse momentum, yield ratios to stable hadrons, and nuclear modification factors. These results are compared to lower energy measurements and model calculations where available.

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Online

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