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Thermodynamics and fluctuations of conserved charges in a hadron resonance gas model in a finite volume

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The thermodynamics of hot and dense matter created in heavy-ion collision experiments are usually studied as a system of infinite volume. Here we report on the possible effects of considering a finite system size for such matter in the framework of a hadron resonance gas model. The bulk thermodynamic variables as well as the fluctuations of conserved charges are considered. We find that the finite size effects are insignificant once the observables are scaled with the respective volumes. The only substantial effect is found in the fluctuations of electric charge which may therefore be used to extract information about the volume of fireball created in heavy-ion collision experiments.

Primary authors: Dr BHATTACHARYYA, Abhijit (Associate Professor, University of Calcutta); Dr RAY, Rajarshi (Associate Professor, Bose Institute); SAMANTA, SUBHASIS (BOSE INSTITUTE); Mr SUR, Subrata (Assistant Professor, Panihati Mahavidyalaya)

Presenter: SAMANTA, SUBHASIS (BOSE INSTITUTE)

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