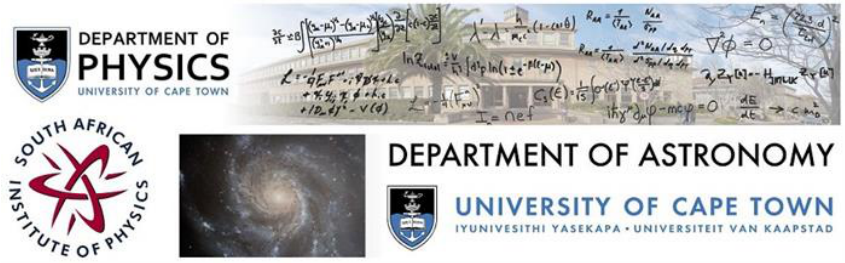

Contribution ID: **28** Type: **Oral Presentation**

Thermal Model and Tsallis distribution for Large Hadron Collider

Wednesday, 6 July 2016 09:40 (20 minutes)

Abstract content
   (Max 300 words)
Formatting &
Special chars

The hadron resonance gas model and its extension to include the Hagedorn spectrum is discussed. The Hagedorn temperature, TH is determined from the number of hadronic resonances including all mesons and baryons. This leads to the result TH = 174 ± 11 MeV consistent with the critical and the chemical freeze-out temperatures at zero chemical potential. We apply this result to calculate the speed of sound and other thermodynamic quantities in the resonance hadron gas model for a wide range of baryon chemical potentials using the chemical freeze-out curve. We compare some of our results to those obtained previously papers. Furthermore, a discussion is presented of results with identified particles at the Large Hadron Collider. Possible deviations from the standard statistical distributions are investigated by considering in detail results obtained using the Tsallis distribution. Theoretical issues are clarified concerning the thermodynamic consistency of the Tsallis distribution in the particular case of relativistic high energy quantum distributions. An improved form is proposed for describing the transverse momentum distribution and fits are presented together with estimates of the parameter q and the temperature T.

Apply to be
 considered for a student
   award (Yes / No)?

No

Level for award
 (Hons, MSc,
   PhD, N/A)?

N/A

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Please indicate whether
this abstract may be
published online
(Yes / No)

Yes

Primary author: Dr WORKU, DAWIT (Cape Peninsula University of Technology)

Co-author: Prof. CLEYMANS, Jean (University of Cape Town)

Presenter: Dr WORKU, DAWIT (Cape Peninsula University of Technology)

Session Classification: Nuclear, Particle and Radiation Physics (2)

Track Classification: Track B - Nuclear, Particle and Radiation Physics