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Chemical and Thermal analysis of LHC data within a blast-wave model with two freeze-outs

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Within a blast-wave model which assumes two different freeze-outs, i.e. the chemical and thermal ones, both the hadron multiplicities and the transverse momentum spectra of various hadrons are analyzed in one model. In this calculation multiplicities of both the thermal hadrons and those decayed from resonances in a certain rapidity interval are calculated separately and the sum is fitted to the data. Usually the measured number of hadrons within a certain rapidity interval is converted into a number of hadrons in the whole rapidity region and the number in the whole rapidity region is regarded as a sum of the thermal ones and those decayed from resonances and fitted. This procedure is correct only when the rapidity distributions of both the thermal hadrons and the decayed ones are same.

Once the chemical analysis is done, by fixing the number of thermal hadrons of a certain species as the one at the chemical freeze-out, the transverse momentum spectra of various hadrons are fitted. Hence the adjustment of magnitudes of the pT spectra of various hadrons is not necessary.

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