Response to the referee:

We thank the referee for her/his remarks and corrections.
We took them into account and now we feel the paper is ready for publication.

Line 18-19: we modified the sentence by adding explicitly that “the inclusion of multi-strange baryons in the evaluation of higher cumulants might provide a sensitive observable to extract the freeze-out temperature”.

Line 28: we added that in a quark-gluon plasma gluon fusion and quark-antiquark annihilation processes are “energetically favoured with respect to reactions involving confined hadrons”. In the following lines this statement is more explained in details through the estimate of the Q-value in both quark and hadron processes.

Line 41-45: the long period has been divided in two sentences, as the referee suggested.

Figure 2: the label on the y axis has been added.

Line 48: following the referee's remark, we modified this part and added that “in the low temperature regime HRG results and lattice data show an agreement within the error bars in both light and strange sector”.

Line 58: we added a sentence to explain the issue on the weak decays and specifically that “Consistently with what is done in the experiment, the contributions from weak decays have not been taken into account: the HRG results have been compared to feed-down corrected experimental data. “

Line 79: kaons and Lambdas have been added to the list of strange particles, as the referee correctly pointed out.

Line 80: we corrected the sentence and added that the flacour hierarchy in lattice data is present only in the high temperature regime.

Line 102: Once efficiency corrected data are available, we would like to apply the same analysis, used for determining the freeze-out parameters from the fluctuations of net-charge and net-protons, to the lower moments of net-kaons. As we have shown in the case of net-charge and net-protons, by fitting the lower ratios of moments for net-quantities is possible to extract both the freeze-out temperature and baryo-chemical potential once compared with data.
We added two more sentences in order to better explain this future project:
“In particular, once efficiency corrected data on net-kaons lower moments from STAR collaboration will be available, we could perform a similar analysis to the one used for net-charge and net-proton moments in [cite our previous work]. Since lower moments of net-kaons seem to be very sensitive to variations of temperature, as shown in Fig.4, we expect that a study of kaons alone might be sufficient to extract the freeze-out parameters.

Line 113: we modified the sentence and we added few comments. The hyperons have to be included in the calculation of the cumulants involved in the ratio chi4/chi2. The plot of this quantity as a function of the temperature, Fig. 5, contains the calculations of this ratio

performed in our HRG model and lattice data extracted from [6].

The different curves define the particle species we included in the calculations, going from a set containing only kaons to a set which includes all the strange particles.
This figure shows that in order to get a steeper curve closer to lattice data particles with strangeness larger than unity must be included.
Here we refer to the freeze-out temperature, but we should keep in mind that only once we compare our theoretical calculations to experimental data as yields or moments of particle multiplicity distribution we are allowed to define the extracted temperature as the chemical freeze-out temperature.