

here are my comments to the CNM chapter. I read the version of 25 March, from the twiki.

ciao Andrea

convener 1

convener 2

convener 3

convener 4

716: I propose to have a section called Introduction here, which will include also the general RAA definition (as we discussed)

Done, to be discussed if we merge sections 3.1 and 3.2

716: AA -> AB

We don't understand: it is already written A-B

720: Y -> N

We prefer to use Y for yield instead of N (simple number)

number the equations

724: rm atomic

725: add a paragraph with the chapter outline

727: because heavy quarks are produced in hard processes in the early

728: rm Apart from hot and dense medium effects

731: here and later change from bold to italics

737: here and later, and with . instead of ;

737: add see Section

743: add see Section .

746: \bar -> \overline

We use the command `\newcommand{\QQbar}{\ensuremath{\overline{Q}}\xspace}`

749: between -> of; rm or a QQ state

751: bf -> it

eq 13: add the dependence on  $\mu_F^2$  for  $\sigma_{\text{had}}$

759-760: is this relevant? what kind of process would this be?

This is the formula used in Fig. 39, and it corresponds to first order quarkonium production, i.e. with a very soft gluon.

761: add leading order somewhere

eq 15: define  $y$  (strictly speaking it is the rapidity of the  $Q\bar{Q}$  pair, and one assumes that it is similar to that of the hadron)

$\sqrt{s_{NN}}$

768 and 769: heavy-ion -> nucleus-nucleus

778: Eq. (15) and (16)

778:  $\alpha_s$

779:  $c$  in italics

780: in pA collisions -> for CNM effects (in fact they are valid also for AA)

We've had long discussions on whether or not the chapter is dedicated to CNM effects or to p-A collisions, which is not the same as you point out. In that section we also discuss hot effects (comovers, hydro effects) and focus only on pA collisions (extrapolation to AA in another section), so we prefer to keep that title.

Fig 24: why using  $m_T$  and not  $Q^2$  on the y axis? PDFs depend on  $Q^2$  and the current plot gives the impression that  $D$  and  $J/\psi$  have a different coverage for the study of CNM effects, while it is not the case. Or am I missing something?

it depends what you called  $Q^2$  ! Typically in perturbative calculation,  $m_T$  would be a rather 'natural' choice for the factorization scale.

We agree that the sensitivity on the PDF resolution coming from the measurement of low  $p_T D$  s and low  $p_T J/\psi$  s should be similar. However we prefer to stick to variables related to measured quantities on the plot, hence  $m_T$  rather than  $Q$ . Of course it has to be clear that  $m_T$  gives the order of magnitude of the resolution at which one probes the PDF, and that it could be a factor of two larger (or two smaller) than  $m_T$ . We could perhaps specify somewhere in the text that *the typical resolution scale should be of the order of the transverse mass of the particle produced* if you think that the plot as it is looks misleading.

789: I'm missing why this is leading to shadowing effects

Added 'due to the destructive interferences from the scattering on different nucleons'

794: extremely larger -> quantify

$\Gamma$  depends on  $y$  and  $p_T$ . Instead we changed 'becomes much larger than the nuclear size at the LHC.'

897: the saturation scale is not defined

Added '(below which gluon distribution in a nucleus starts to saturate)' (sufficiently vague to be true)

917: relate  $l_c$  to the times in section 3.2.1?

I replaced coherence length  $l_c$  by coherence time  $t_c$

fig 30: xF is not defined (I think); can the arrow on top of the left figure be removed?

I defined xF and kept the vertical arrow (I explain its signification).

1028: plots -> figures of the following sections

Table 8: Medium effects -> CNM effects; add references; why are there empty cells in the table? is this missing information or fields that do not apply to a given model?

1030: the next sub-sections -> this section; rm performed

1032: subsections -> sections

1036: endeavour into -> carry out

1049: give sqrt for CDF data

1049: give some numbers for the error of the scaling factor vs pT, as it is done later for onia

1064-78: this part seems too long and detailed

1090: hydro -> is this the first time it is mentioned in the context of pA? Maybe it should be introduced in the introduction, as a short sentence with references.

1093: the s of K0 should be upper case and not italics

1098: eta\_lab -> eta?

1102: **The** Dalitz

1107: origin -> track; scrutinizing -> exploting

1108: later -> latter

1110: in agreement -> consistent

1111: with -> on; has been -> was

1114: the midrapidity low pT is not well described by Vitev

1125: hydrodynamics -> too generic, should be introduced earlier on

1132: can we comment on the comparison with pp or theory?

1136: I would remove the sentence Up to today lower energies

1138: rm This distribution (it was not done for pPb)

1142: small or negligible -> smaller than 10-20%

1152: what do you mean by initial state effects here?

1170: Jpsi + K or phi

1178: cite PYTHIA

1180: Within uncertainties, these results conform

1201: the medium -> due to CNM effects

1203: ALICE -> add reference to a proceeding (should be already in the biblio)

1206: rm At RHIC collisions ; rm mainly ; channel -> channels

1212: it is a bit weird to use  $y$  for STAR and  $y_{\text{lab}}$  for ALICE

1221: is -> are

1231: rm also

1238: , as shown in Fig. 36.

1239: at LHC energy

fig 39: move fig to top of the page (also for the following figures)

the option [!htp] is used. Is there another option to be used to force the figure to be moved at the top?

1262: center -> centre (change everywhere)

1277: are consistent

1278: aforementioned models

fig 40: add ref for ALICE data

1288: overestimate\*s\*

1299: density-weighted

1301:  $r_{\text{T}}$

1313: about 1.4 at pT of 7 GeV /c

1322: heavy flavour probes are characterized by the same .

1324: fig -> Fig; heavy-flavour decay leptons

1328: suggesting that the reduction of Jpsi production is related to the reduction of  $c\overline{c}$  pair production

1329: than leptons from open heavy-flavour decays

comment on the caveat of comparing Jpsi and leptons vs pT: Jpsi pT is the pT of the  $c\overline{c}$  pair, while leptons come from D mesons with significantly larger pT, which in turn come from c quarks with even larger pT. I.e. a Jpsi with pT 1 GeV comes from a  $c\overline{c}$  pair with pT 1 GeV, a 1 GeV electron could come from a c quark with pT of 5 GeV or more.

we added: One should however emphasize that the comparison of the open heavy-flavour and  $\psi$  production is carried out as a function of  $\sqrt{s}$ . The  $c$  quark fragments into a charm mesons which in turn decays into a lepton and it is not straightforward to relate the decay lepton momentum to the parent quark momentum in order to interpret accurately this comparison.

1335: for -> of

1336: check if the binding energies are the same as given in ch 5

1344-1350: add stat and syst

1348-50: add a space before  $\sigma$  (with  $\backslash$ ,)

1353: follows **a** similar; than -> as

1359: does -> do; rm such

1360: fig -> Fig; It describes -> They describe; effect was -> effects were

1366: pp **collisions**

1368: both -> the two

1379: give **a** hint

1380: **A** similar; B-mesons -> B mesons

1390: at slightly -> in slightly

1393:  $y$  ->  $y$

1394: effect\*s\*

1396: are not precise enough to be sensitive to a difference as observed by CMS.

1398: in between -> between

1400: using pp collisions

1401: lower than one by  $2.4\sigma$

1404: neither -> nor

1405: in a larger -> with a large

why would measurements with large  $y$  range help?

we added: Precise measurements in a larger rapidity range, which covers different comoving medium density, would help to confirm this hypothesis.

1407-10: multiplicity -> activity

1411: rm event activity

1412: comma after involved

1413: is related to Multi-Parton Interactions (MPI)..

1417: rises -> slopes

1419: details -> detail

1422: disscused -> discussed

1423: I would remove rather straightforwardly

1423: break sentence and start with This is the case ..

1424: comma before discussed

1428: the relation (14) -> Eq. (14)

eq 23: \times -> \cdot

1440:  $\overline{Q}$

We use the command `\newcommand{\QQbar}{\ensuremath{\{\overline{Q}\}}\xspace}`

1452: nucleus nucleus; includes -> include; color -> colour; as is -> as

1454: rm such

1455-72-73: center -> centre

1458-9: scenarios (twice)

1478: 8/7 -> shouldn't it be  $5.02/2.76 \cdot \exp(-0.465)$  ?

We have the following relations:

$$\sqrt{s^{PbPb}} = 2 \sqrt{Z/A} E_p^{PbPb},$$

$$\sqrt{s^{pPb}} = 2 \sqrt{Z/A} E_p^{pPb}$$

$$y_{CM}/\ln s^{pPb} = 1/2 \ln(A/Z)$$

So, putting all together, we get:

$$x^{PbPb} / x^{pPb} = E_p^{pPb} / E_p^{PbPb} = 8 \text{ TeV} / 7 \text{ TeV} = 1.14$$

1482: combination

1481: this is discussed also in chapter 5, please check and avoid repetition

In the CNM section, we are supposed to explain how the extrapolation from p-A to A-A collisions can be done. So, it is natural to compute here the  $R_{pA}(+y) \cdot R_{pA}(-y)$  factor, and we don't think it is a problem to repeat this value in Quarkonia section.

1491: flavours -> flavour

1491: is consistent with binary scaling within uncertainties (maybe quantify them); I think there is no indication of a slight suppression at low pT

1493: comma after midrapidity: when we move to the most forward bins -> at forward rapidity

1496: remove points

1499: heavy-flavours -> heavy flavour; favour /disfavour -> discriminate

1502: but compatible -> not clear, needs to be rephrased

1504: presently unique -> only

1506: rm So

1507: but the present experimental uncertainties do not allow for definite conclusions

1508: heavy-flavours -> heavy flavour

1510: I would remove this part on the systematic errors

Why?

1510: bandes -> bands

1512: high statistic -> high-statistics

1514: In -> At

1516-1520: not clear what the message is; maybe I would put this part in section 3.4

No, here we discuss not only status but also short-term perspectives, i.e. Run-II. So, it is natural to discuss the best strategy for next p-Pb run.

---

This topic: ReteQuarkonii > Andrea

Topic revision: r9 - 2015-04-28 - PhilippeRosnet



Copyright &© 2008-2020 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.

or Ideas, requests, problems regarding TWiki? use Discourse or Send feedback