

Comments on “Design and expected performance of the MICE Demonstration of Ionization Cooling” – Draft 1.3

Generally a very nice paper. A few wording issues follow.

- Line 30 “to study of” should be “to study” or “**in** a study of”.
- Line 36 Is the beam really focussed by solenoids, or confined by them? (Maybe including fringe fields there really is focussing?)
- Lines 48-49 Punctuation problem. Either replace full stop with comma, or change “being” to “is”.
- Line 52-3 “a material **with**”, but there are other problems!
You need **large** or **long** radiation length, not **low** radiation length!
Radiation length is not Z ! Or is this supposed to say “low atomic number (Z)”?
- Eq. (1) In some places in this paper, “ c ” is italicised, which I would prefer. This occurs in some instances of “ MeV/c ” but not others, and not here. This should be consistent – check both text and figure captions – there are lots of instances, which I won’t list here.
- Marginal line numbers are screwed up here! I will relate to the position of the equation!
- Line after eq. (1), and also 2 lines above: “rate” or “rate of change” normally means “with respect to time”, which is clearly not what you mean here. I think it is acceptable to say “rate”, but you should say what it is with respect to. “ s ” is nowhere defined.
- Line 57 “ Z ” should be italicised, and defined if this has not been done previously (e.g. in line 53).
- Line 67 Another unitalicised “ c ”.
- Line 77 Maybe this is OK, but it seems odd that “momentum spectrometers” are abbreviated “SSs”, without explanation that the first S is for “superconducting”. (You do say the solenoids are superconducting in the next sentence.)
Is [8] the best reference here?
- Line 101 “Beryllium” should not be capitalised. (Lithium and hydrogen weren’t.)
- Figure 3 Axis label – I don’t think “ z ” has been defined anywhere.
“ z ” should also be italicised. This also applies to figures 4, 5, 6, 8, 9, 12, 13, 14, 17, 18.
Caption – does “centre of the positions” mean “positions of the centres”? Also for figs 4, 5, 6, 8, 9, 12, 13, 14, 17, 18.
- Line 111 Sentence structure. Change “helps” to “helping” (or split into 2 sentences).
- Table 1 (I personally wouldn’t italicise subscripts “SS”, “FC”, “RFmodule” as they are not symbols. However, I don’t feel strongly about this!)
- Figure 5 Caption – Should you have the words “Magnetic field” before “ B_z on axis”? I’m not sure “ B ” has ever been defined. (I’m not sure I’d hyphenate “on axis” either, but am not fussy on that point!)
- Line 148 Change comma to semicolon?

- Table 2 Are the “(A)”s redundant? What do they mean?
- Table 4 I guess it’s obvious that “conf.” means “configuration”?
 A couple of hyphens (short dashes) where there ought to be minus signs. (Not in math mode?)
 It is not obvious to me what “Value Gaussian” means! (Was “Value” supposed to be a column heading, as in the top part of the table?)
 I do not believe that an RMS can be “±”! By definition, an RMS is positive.
- Line 167-8 I was not sure what the last sentence of 5.2 was saying! Does the phrase “This measurable difference would confirm that,” actually add anything? (How does it confirm it?)
- Figure 8 Axis label – why “total” energy? Is this to indicate kinetic plus rest-mass? It wasn’t clear to me. I don’t think you’ve made this distinction in the text earlier. (Also figs 12, 17.)
- Line 190 Should the distinction between normalised and geometric emittance have been introduced earlier in the paper? (Or is this well known to accelerator physicists?)
- Line 192 “phenomenon” not “phenomena”.
- Line 193 “mm” should not be italicised (3 times).
- Line 217 (I’m not sure “DEMO” needs to be in block capitals.)
- Line 229 Ref [4] – “MICE” and probably “IV” should be capitalised.
- Line 230 Ref [5] – Has bibtex scrambled this? “T.M.” should be “The MICE”; in the title “MICE” should be capitalised. Why a comma after “Jan.”?
- Line 242 Ref [11] “S.A.” should be S. Agostinelli” I think.
- Line 245 ref [12] – the article name looks a bit scrambled?

CNB