Protocol as a scientific secretary

Session V Code development
(Wednesday April 17 2013 morning/afternoon 11:30 - 16:00)
chairperson: Y. Alexhahin
scientific secretary: Joschka Felix Wagner

Talk: Shinji Machida

Stephen Brooks:
„I think you haven't mentioned errors caused by timestep in the simulation and field map resolution and space charge grid resolution and the problem is that those are too large . Then you can converge to something that looks like its statistical limited, but its still wrong„

Shinji Machida:
„In this case for example the timestep, i think thats more than enough and well we propably need to repeat the same exercise with a different timestep and different grid size and those things, thats certainly true. „

Stephen Brooks:
„This is a nice procedure for the statistic number of particles but there is about three other pracmatism these codes and also need a procedure for setting“

Shinji Machida:
„Yes thats right. On the other hand for example the grid number, if you have enough number of particles [..] the number of particles depend on the grid size. If you have more grid size probe, you need more number of particles but then the convergence is still the same. Not to the same doesn't mean the same number but maybe twice as much if you mean twice as much grid size“

Stephen Brooks:
„but both of them have to be sufficient, thats the thing“

Ingo Hofmann:
„I think that is interesting to compare numerical and statistical noise but now i'm not a friend of frozen space charge or analytical models… but i want to speak one word in favor of this frozen space charge. This is all an issuse of a smoothing, frozen space charge is a perfect smoothing and you loos of course – it is not the right way for the RCS of course as you clearly show, but if you have no smoothing then of course your fluctuation becomes very big. So you really have to see what your problem is and i can i see there are problems, the beam loss is actually quite well described if you do a well smoothed potential – space charge potential with a relatively low number of particles and still you get a very good result. The answer of your problem really depends on your problem and the driving source of your beam loss and it is not so easy to generalize it. The potential smoothing must be an important ingredient-additionally ingredient“

Shinji Machida:
„okay, yes the smoothing its easy to say but when you have really this sort of time dependent beam dynamics how can you really pratically introduce this smoothing for such a tragent beam - thats another issue instead of thinking in that direction maybe my way is a little bit brute force, but thats my suggestion“

Kazuhito Ohmi: --- unfortunately not clearly understandable ---
Keywords: statistical beam loss, smoothness of potential, even PIC frozen that means no beam loss, given inital potential or some timing, for example after ten thousand turns potential is frozen

Shinji Machida:
„But thats basicaly the probe model but not the PIC“.

Kazuhito Ohmi:
„The PIC, the PIC probe“

Shinji Machida:
„Thats a new thought of simulation“

Talk: Kazuhito Ohmi

Alexey Burov:
„If i understood you correctly..come to space charge to tune distribution only and you neglect resonance driving terms coming from the space charge they come only from the lattice?“

Kazuhito Ohmi:
„yes, for this analysis.“

Alexey Burov:
„Could you please lost a word for this justification of approximation? It sound interesting.“

Kazuhito Ohmi:
„lets shove that to the general discussion“

Alexahin:
„If there is some joint effect of sextupoles and space charge or you will obtain the same losses without space charge at all just with the sextupoles? (reformulates the question) Was space charge necessary to observe the losses?“

Kazuhito Ohmi:
„just as tune spread“

Alexahin:
„space charge doesn't contribute to resonance driving?“

Kazuhito Ohmi:
„yes“

Talk: Jeff Holmes

Stephe Webb: comment:
particle pair, project strongly coupled plasma with the air force, discussion about GPU usage

particle particle and macroparticle macroparticle interaction

Jean-Luc Vay:
do you use higher order precision and or digital filtering?
Plasma PIC codes usually use filtering.

Talk: Vorobiev

Vorobiev to Jean-Luc Vay :
You want to ask me about fitting, right!?

Jean-Luc Vay:
„Concerning the splines you did not mentioned the studies of XY (couldn't understand the name, perhaps Haukuda) about nonlinearistics, they looked at the effect of the splines in detail. There is a paper from 1970 “

Vorobiev:
„I missed this. I know there are some concerns that splines are not good. I simply did not run into it (the paper)“

Jean-Luc Vay:
„there is a lot of work that has been done by the plasma community“

Talk: Frank Schmidt

not known:
„You told about the space charge kicks. can you explain how do you find the kicks?„

Schmidt:
„We are using beam beam kicks, just kicks. This is just implemented in MADX“

not known:
„dependencies of the transversal position are linear, nonlinear or gaussian?“

Schmidt:
„just normal“

Talk: J.Amundson

Alexey Burov:
„your very last statement about benchmarking this process. You showed us benchmarking related to incoherent effects. Have you a slide concerning collective effects? “

„have you tried to reproduce any collective effects?“

benchmarking with landau damping!?

From england:
„how many degrees of freedom? Not able to simulate multi species!?“

Amundson:
„multi species not yet implemented“

question from audience:
„which cavity models?“

Amundson:
„we have simple cavity models. To implement more realistic ones that is what the user can add in the end“

Giuliano Franchetti:
„six step tracking for 10^5 turns. How long does it take?“

Amundson:
„about a week“

Ingo Hofmann:
„can you give an expample where more physics is inside by going 10 million to 100 million particles?“

Amundson:
„i have not looked about the scaling things. We tried more with bunch bunch interaction and there are 1million particles per bunch“