

From the MICE proposal...

3.5.2 Exploration of different absorber materials

As already mentioned, another important part of the experimental programme will be the test of different absorbers. It will be straightforward to replace the liquid hydrogen with liquid helium. The mechanical assembly of the liquid hydrogen absorbers will allow replacement of one of the absorber windows (see Section 6) by a structure supporting solid absorbers. This changeover will require a few weeks but will allow the precise measurement of cooling with different materials. The purely experimental systematic errors on the measurement of the cooling performance will largely cancel out in the comparison among different materials.

Because of the perceived complication in pulling in and out the AFC modules, we devised the spool piece to be able to do this at the step III.1 time in a more practical way (a few hours to change an absorber instead of a few weeks)



DISCUSSION

Should we run directly with step IV rather than III / III.1 / IV

Scientific matter

step III =

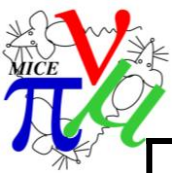
- III test two solenoids with **nothing** in between (vacuum between tracker flanges)
- III.1 idem with a series of **solid absorbers** that can be readily interchanged in the spool piece (sliding absorbers in and out = a few hours)
 - 1- beryllium
 - 2- LiH
 - 3- Plastic (measure directly e.g. effect of one/several tracker plane(s) multiple scattering and energy loss)
 - 4- aluminium (this can be done with empty absorber at StepIV)
 - 5- other material that is liable to be present in neutrino factory (e.g. Titanium windows)

OTHERS? We have not actually worked out a complete wish-list - pls don't exaggerate!

- is it possible/desirable to do this program with the AFC in place?
 - all possible even III?
 - additional risk and time?
 - simplification for simulation/reconstruction/analysis?
 - **need precise field map of AFC!**

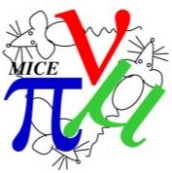


slides for discussion time



Practical matter

item	step III	step IV
nothing	OK	OK, if field map is accurate not same as "empty"
N solid absorbers	spool piece, N. $\frac{1}{2}$ day (?) change time No risk	AFC move in out N x (one week) Some risk to AFC
Liq H2	--	OK empty (just windows) and full absorber
	overhead for moving SS2 from one place to the next how much time? risk seems moderate	Save time and effort -- no moving SS2 -- running/reconstruction/ analysis of two different configurations



Conclusion

-- There is definite advantage in running directly to step IV from the point of view of software and analysis
provided the field map is precise

-A- However there is of the order of one week spent just moving the AFC (without LiqH₂) back and fro to perform each solid absorber measurement. This may involve a risk to the AFC (and very likely some resistance in doing so!)
How many do we plan for ? 5?

-B- This has to be compared with the additional complication of moving the SS2 from step III position to step IV position
-- how much time and effort w.r.t. 5 AFC in/out moves?



what we can do today

- agree on getting the field map.
- agree that at equal effort on Tim Hayler et al, the step IV direct route is somewhat preferable (not a very strong case)
- but the step IV route limits the number of different materials that we can measure