

SPL dump FLUKA simulations, 27 January 2010

present: O. Aberle, R. Garoby, F. Gerigk, F. Haug, E. Lebbos, T. Otto, V. Vlachoudis

Discussion items:

- E. Lebbos presented (<https://edms.cern.ch/document/1059198/1>) 3 design options for an SPL dump located at the end of the SPL, where the tunnel slope is increased from 1.7% to 8.4%.
- The designs can be improved by placing a material at the upstream side that has better shielding properties, thus reducing the number of neutrons coming from the dump (e.g. graphite).
- Last year Th. Otto was working on a similar dump design in the frame of SLHC-PP. This dump was meant as injection dump for PS2, dealing with the unstripped/half stripped H-. The work was done in collaboration with GSI based the FNAL (Project X) design. Th. Otto will use this design to do some preliminary estimates on shielding requirements for the SPL dump.
- We can assume that after the SPL commissioning the dump will never be accessed. It can be reduced to an emergency dump in case of dipole failure, and one can foresee a 2nd dump (e.g. the PS2 injection dump) for machine start-up,
- Instead of a permanent cooling water flow using a pump, one can use passive heat pipes. These devices have liquid inside but it circulates by convection and does not need a pump.
- In order to get more distance between dump and tunnel one can consider to increase the slope in the transfer line. It seems that we need around 3 metres between dump and the ceiling of the transfer line. It must be checked by how much these 3 m can be reduced, when using concrete and earth in between. With the assumption of 3 m and a 10-15% slope one can estimate a distance between the dump and the branching point of 30-50 m.
- There is around 30 metres between tunnel bottom and ISR level, which means ~20 m between dump and overground streets. It is assumed that this is enough to ensure unrestricted circulation of the public on the surface.

Action plan:

- Vasilis group will work on how to get the heat out of the dump core, preferably without using active water cooling.
- Thomas will re-use SLHC-PP design and work on the shielding and the geometry definition, crucial point is distance between tunnel ceiling and dump when having concrete or iron in between, 2-3 months for Thomas.
- Thomas will get in touch with the group at the Soltan Institute for support.

next meeting 1-2 months from now, March

-- FrankGerigk - 23-Mar-2010

This topic: SPL > Dump27Jan2010

Topic revision: r1 - 2010-03-23 - FrankGerigk



Copyright