Estimates for the size of the linac beam dump
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I used 2 MW proton beam in my model for the estimates.
This power corresponds to 1.56e15 proton/sec.

There are four items I have looked at:
1. Deposited energy in the core of the dump;
2. Residual activity on surface of shielding blocks;
3. Prompt dose;
4. Water activation.

The item 1 does not depend on the size of the dump since the core should be cooled. This is the subject to further investigation. A double Gaussian beam of H- (that is 1p + 2e-) with sigma=3mm disposed in graphite results in a temperature rise of 166 K due to protons and 150 K due to electrons. This gives us about 300 K of the instantaneous temperature rise per pulse (1 pulse is 1.56e14 proton). Since there will be 10 pulses per sec., the temperature may become too high. We'll need ANSYS-based calculations for that.

I started with a model of the MI dump in order to estimate the size of the linac dump. The MI dump consists of a graphite core with dimensions of 6" x 6" x 8', AL box - 18" x 18" x 9', steel shielding - 7' x 7' x 20' and concrete shielding - 14' x 14' x 26'. There are concrete blocks in front of the dump to prevent the albedo particles from coming out. The dump is placed in a room with the dimensions 16'-4(vert.) x 21' (horiz.) x 52'. The given geometry and 2 MW beam results in the following numbers.

1) Residual dose is about 1000 mrem/hr on concrete surface of the dump (0 cm/30 days/1 day).
2) Prompt dose - 1.0e7 mrem/hr on top of concrete shielding. One needs 9 extra m of concrete and soil to bring the dose down to the uncontrolled area limits (0.05 mrem/hr).
3) Star density >= 1000 star/cc/sec x 2e7 sec/year = ne10 star/cc/year.
The star density numbers need confirmation. The limit is about 6e10 star/year/cc.

If one adds 1' of steel to the shielding then the residual dose becomes about the limit of 100 mrem/hr, prompt dose on surface of dump - 1.0e6 mrem/hr and hence one needs about 8m of concrete plus soil to have good numbers, star density becomes OK too.

The simulations showed that the MI beam dump is probably a bit long for our conditions since it was designed for a 150 GeV beam. It could be made shorter probably.

The bottom line.

After adding 1' of steel in each (transverse) direction the dump becomes:

1) graphite and Al are not changed (depends on the cooling capabilities of the system, which are not known yet);
2) Steel shielding becomes 9' x 9' x 20';
3) Concrete shielding - 16' x 16' x 26';
4) Room size - 18'-4 vertically, 23' horizontally, length - 52'.
5) Concrete walls of the room - 0.5m thick. Roof - 3', ceiling - 3'-6.
6) One needs 7m of soil on top of the room ceiling.

I would keep the same dimensions for the concrete blocks in front of the dump as for the MI dump. The length of the room is conservatively kept the same as well.