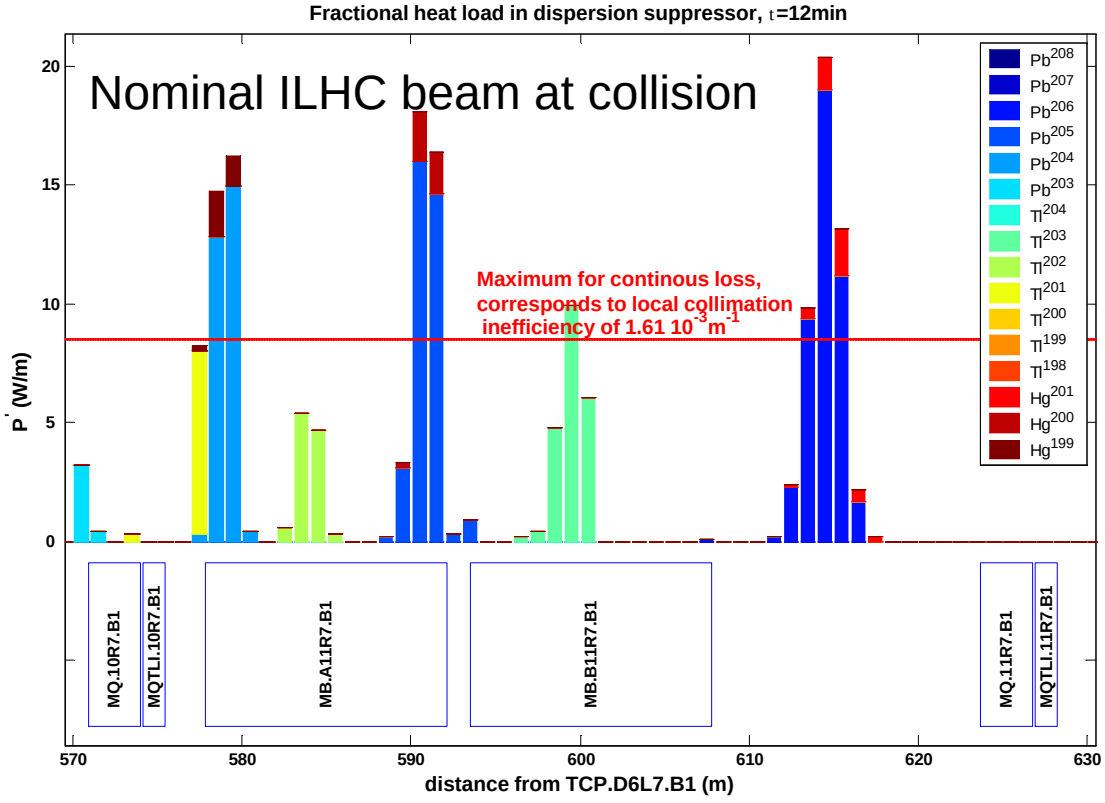
Requirements for Ion beams

Two beam collimation doesn't work well for ion beams.
Consequence: Losses in Dispersion suppressor dipoles

Minimum requirement for ion beams to avoid quenches:
Sufficient density of beam loss monitors on DS dipoles downstream of IR3 and IR7 !

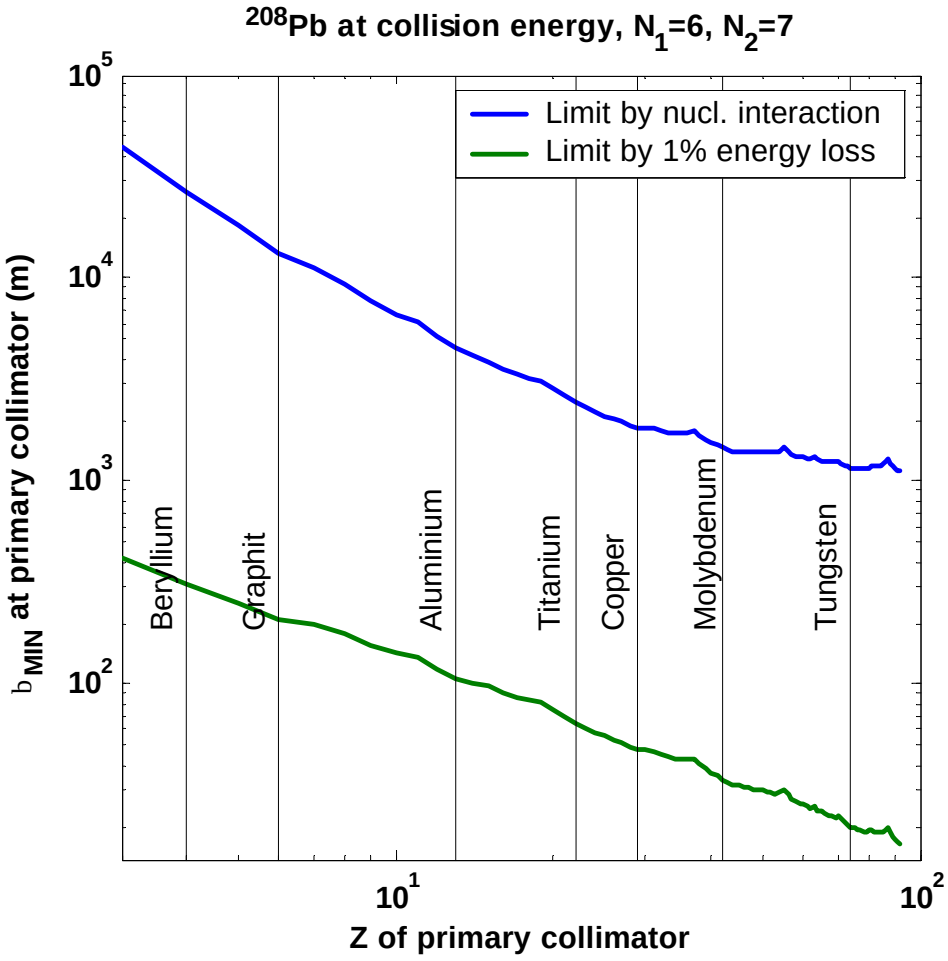


Condition for functioning of two stage betatron amplitude collimation:

$$b >> \frac{\left(n_2^{\,2} - n_1^{\,2}\right) e_N}{g \; dj_{N,E}^{\;2}}$$

dj_N ***: = r.m.s. scattering angle for one nuclear interaction length***

dj_E ***: = r.m.s. scattering angle for 1 % energy loss (arc acceptance)***



Potential locations for Ion beam spoilers

The required collimation functionality for ions may be achieved with short high Z spoilers as primary collimator. The only places with sufficiently large b are after IR triplets downstream of low b IP.

This needs verification by detailed simulations, but place should be reserved for these spoilers !