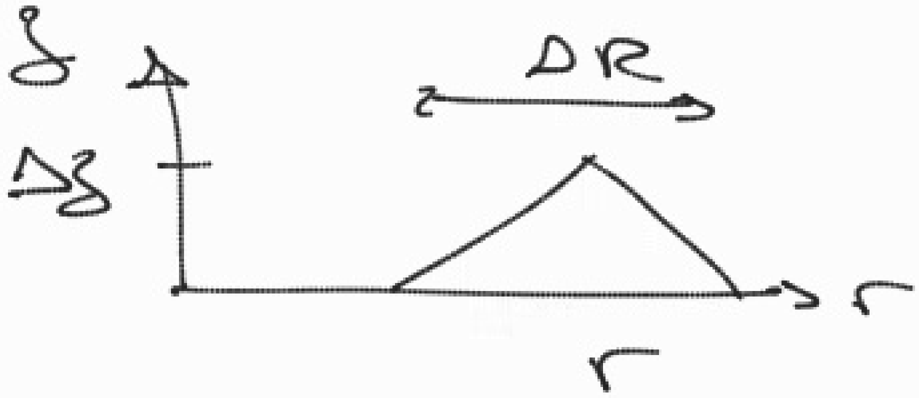
Results from FCi2 :

$\partial_t \Phi_c = 6.0\,T.\,mm^2.\,ns^{-1}$

which corresponds to the production of B_p is $S = \frac{\Delta R\, \Delta z}{2}$ per time:



It is important to note that $\partial_t \phi$ linearly depends on Δz

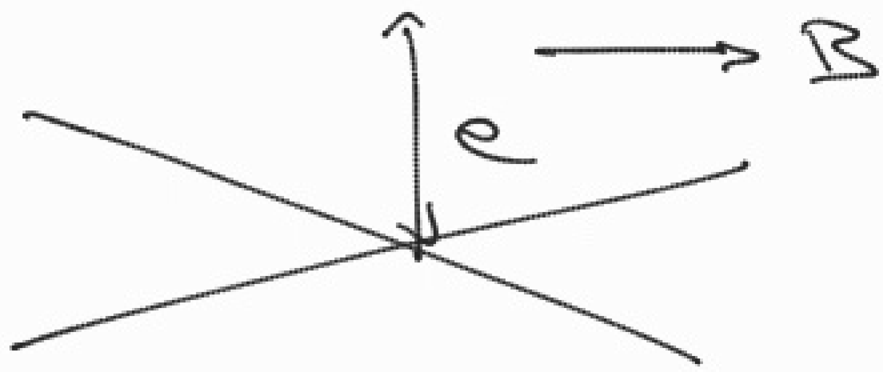
w/ $\Delta R = 600\,\mu m$
$\Delta z = 40\,\mu m$
$\tau = 5\,ns$ (total irradiation)

$\partial_t \Phi_c$: creation rate

The reconnection rate is

$$E_r = BV$$

$$= B\frac{e}{t}$$



$\frac{e}{t}$ being the plasma velocity - w/ an extension λ in the third direction,

$$\partial_t \Phi_p = \frac{B\lambda e}{t} = \lambda E_r \quad \text{(loss rate)}$$

Stationary if $\partial_t \Phi_c = \partial_t \Phi_p$

$$\rightarrow \lambda E_r = \partial_t \Phi_c$$

that is $E_r = \frac{1}{\lambda} \partial_t \Phi_c$

Remember that $\partial_t \Phi_c$ is numerically integrated in FCi2 and <u>linearly</u> depends on λ.

So E_r should not depend on λ ... I think!

One can then compute E_r in $T.mm.ns^{-1}$

It can be compared w/ the critical 0.1 dimensionless value with $B_0 = 600$ T & $V_0 = 200$ km.s^{-1}

$\lambda = 40 \mu m$

In dimensionless units:

$$E_r^* = \frac{E_r}{B_0 V_0} = \partial_t \Phi_c \frac{1}{\lambda B_0 V_0}$$

$$= \frac{6\ 10^{-8}\ 10^{9}}{40\ 10^{-6} . 600 . 2\ 10^{5}}$$

$$= 1{,}25$$

which is a little bit too large, but not that far from 2D simulations —

Should we:

decrease $\partial_t \Phi_c$?

increase λ, B_0, V_0