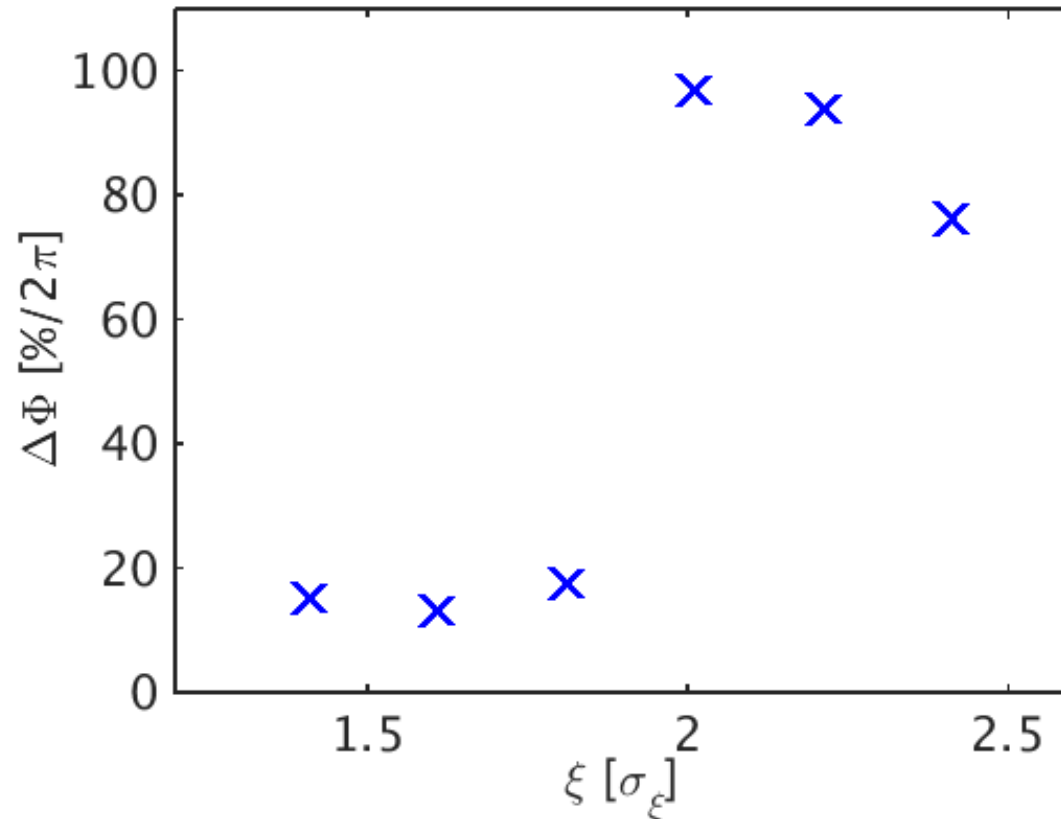# Group meeting

30.08.19

Fabian

Seed wakefields

Calculate the transverse seed wakefields for the SMI-SSM transition point at 1.8 sigma

Seed wakefields - formulas

The transverse wakefield:

$$W_r(\xi, r) = \frac{-n_{b0}e}{\epsilon_0 k_{pe}} \int_{-\infty}^{\xi} n_{b\parallel}(\xi') \sin(k_{pe}(\xi - \xi')) d\xi' \cdot \frac{dR(r)}{dr}$$

with their dependency of the long. wakefields R(r) :

$$R(r) = k_{pe}^2 K_0(k_{pe}r) \int_0^r r' n_{b\perp}(r') I_0(k_{pe}r') dr' + k_{pe}^2 I_0(k_{pe}r) \int_r^{\infty} r' n_{b\perp}(r') K_0(k_{pe}r') dr'$$
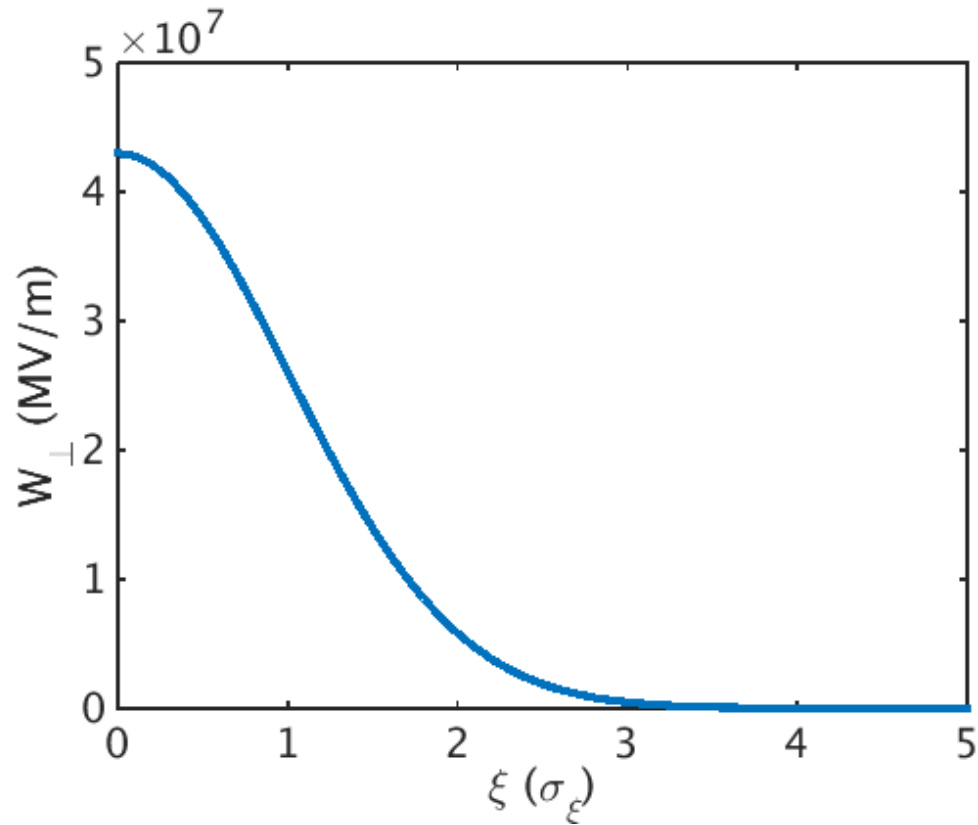
And

$$\frac{dR(r)}{dr} = k_{pe}^2 K_0(k_{pe}r) r n_{b\perp}(r) I_0(k_{pe}r) - k_{pe}^3 K_1(k_{pe}r) \int_0^r r' n_{b\perp}(r') I_0(k_{pe}r') dr'$$

$$+ k_{pe}^2 I_0(k_{pe}r) r n_{b\perp}(r) K_0(k_{pe}r) - k_{pe}^3 I_1(k_{pe}r) \int_r^{\infty} r' n_{b\perp}(r') K_0(k_{pe}r') dr'.$$
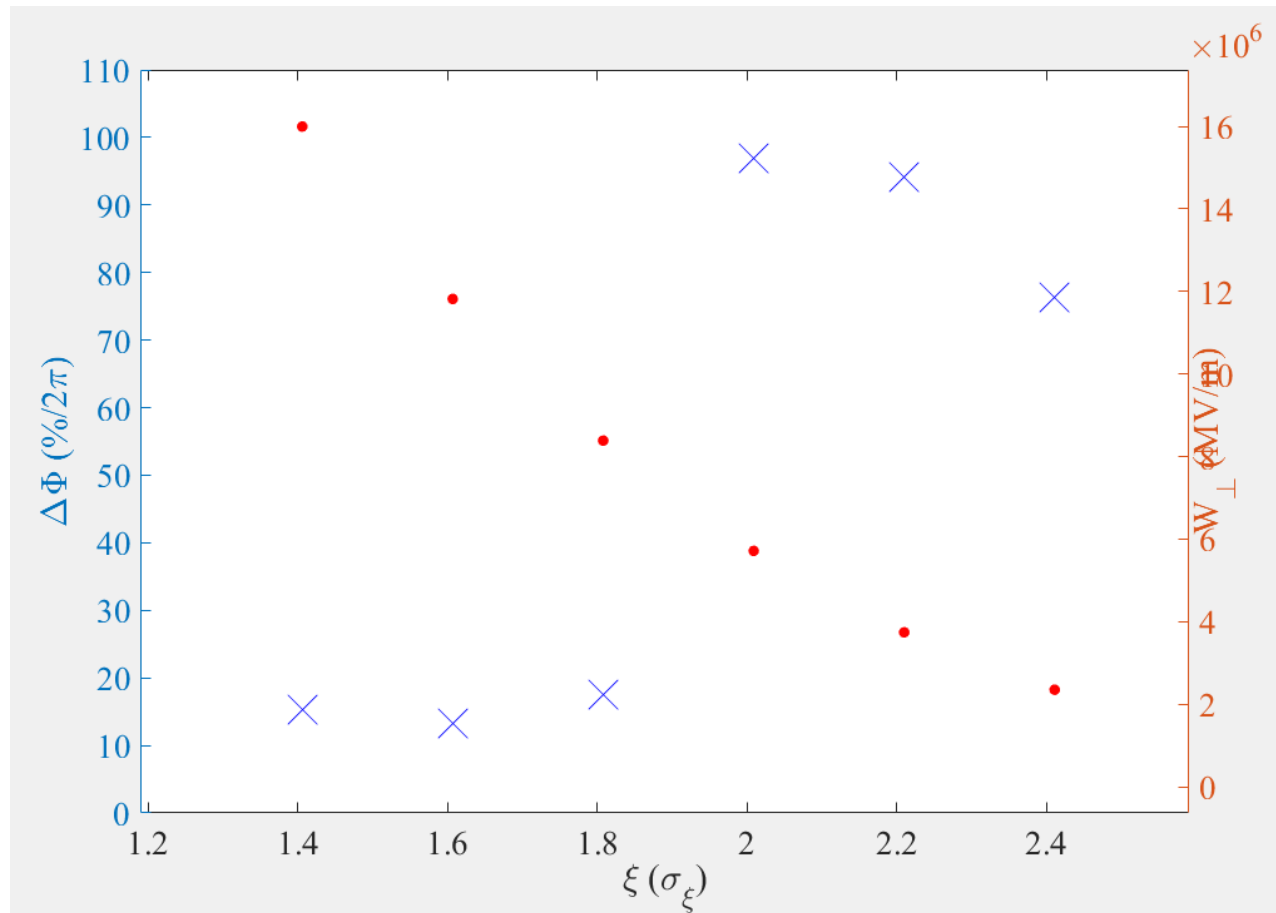
K_0, K_1, I_0, I_1 are Bessel function

Seed wakefields

The Result:

Seed wakefields

The Result:

(layout to be improved)