

**Single bunch parameters:****Bunch charge: 1 nC****r.m.s. length: 13 psec****Instability thresholds:****longitudinal microwave:  $Z/n = 36$  mOhm eff.****Design parameter for component design:**

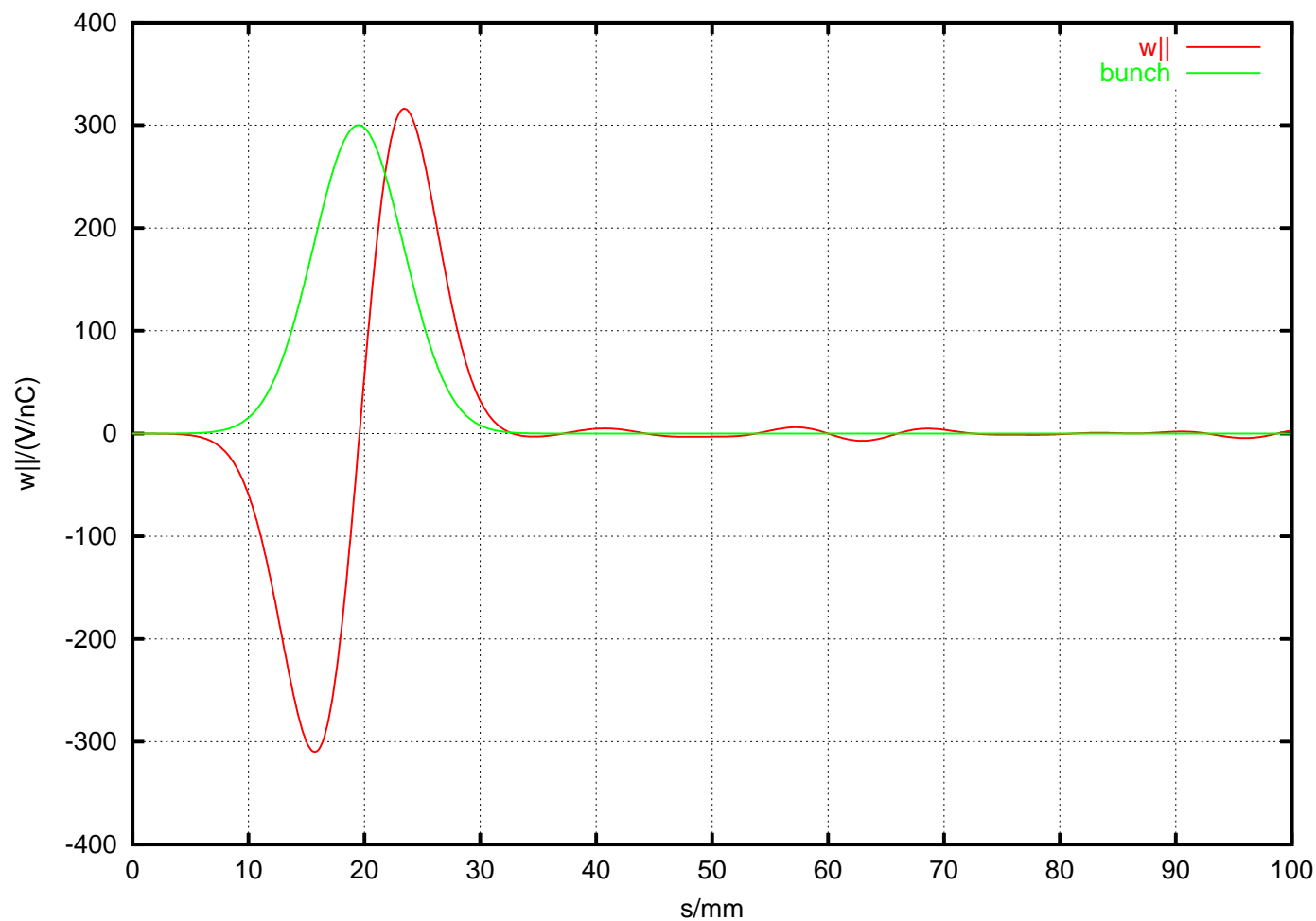
$$Z/n_{eff} = j\omega_0 \frac{\int j\omega Z(j\omega) |I(j\omega)|^2 d\omega}{\int \omega^2 |I(j\omega)|^2 d\omega}$$



## Broadband Impedances

### Properties of insertion devices

Name	Chamber Material	Aperture/mm	Length/m	$Z/n_{RW} / m\Omega$	$Z/n_{geo} / m\Omega$
4S	Al	5	2	1.0	1.4
6S	Cu/Ni	4	2	1.0	1.4
9L	St	15	9.5	2.7	0.7
11M	Al	11	4.2	0.9	0.7

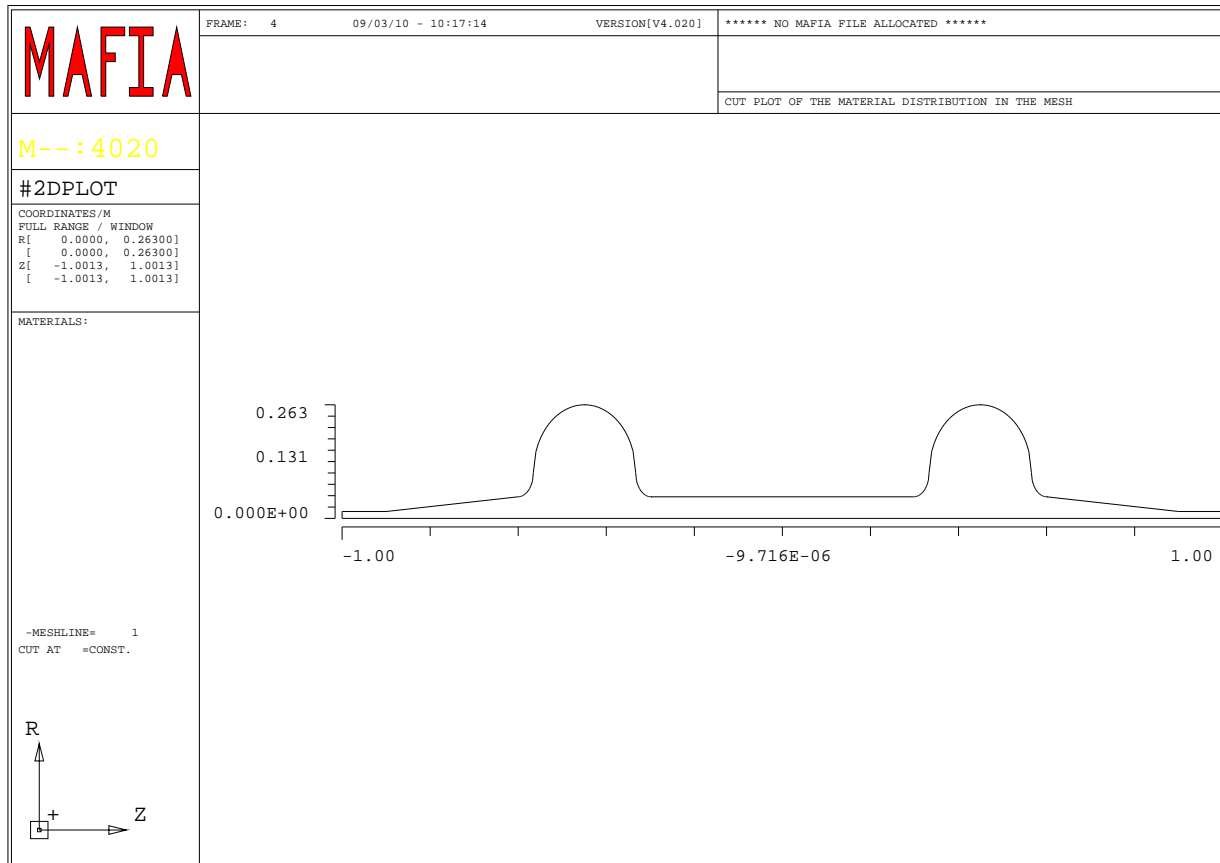


**Result:**

**$k_0 = 4.2$  V/nC,  $Z/n$  eff = 1.4 mOhm**

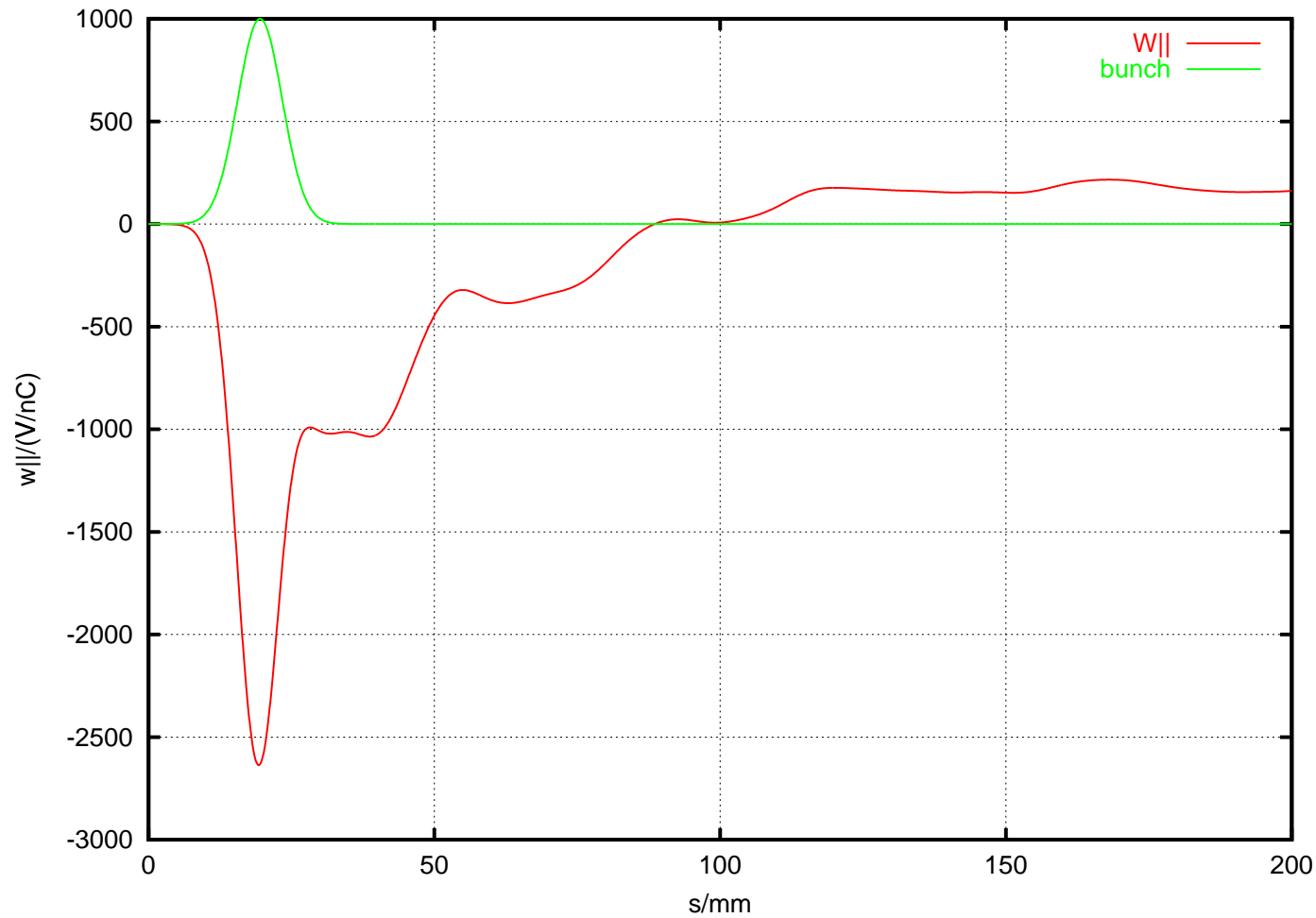


# Broadband Impedance RF Cavity



**Model used for MAFIA calculation:**

**Cavity pair including tapers, total length: 2m**



**Result:**

**$k_0 = 3900 \text{ V/nC}$ ,  $Z/n \text{ eff} = -0.6 \text{ mOhm}$**



## SLS Broadband Impedances



**Preliminary estimate assuming 9 insertion devices**

<b>Resistive Wall</b>	$Z/n_{eff}$
Ring chamber	28 $m\Omega$
Injection straight	2.5 $m\Omega$
Insertion devices	10.5 $m\Omega$
<b>Geometrical Impedances</b>	$Z/n_{eff}$
Bellows	0.5 $m\Omega$
BPMs	1.7 $m\Omega$
RF Cavities	-1.2 $m\Omega$
TMBF kickers	-2.6 $m\Omega$
Insertion devices	9.5 $m\Omega$
<b>Sum</b>	48.9 $m\Omega$