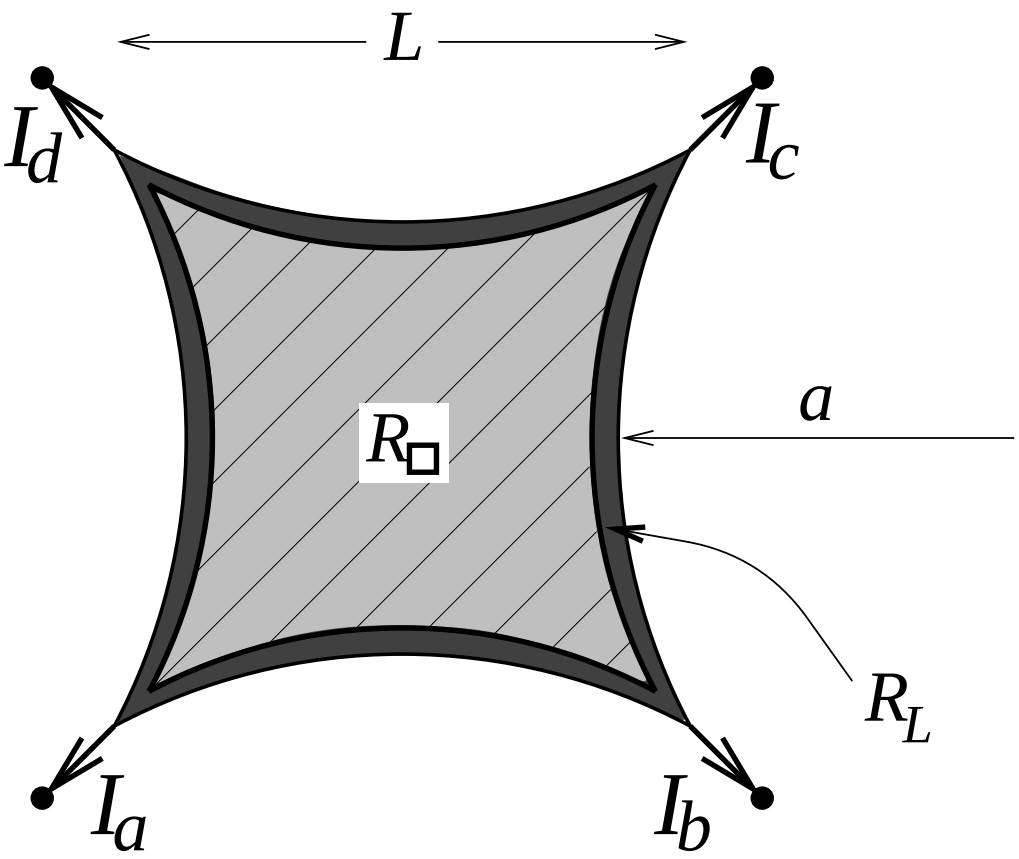
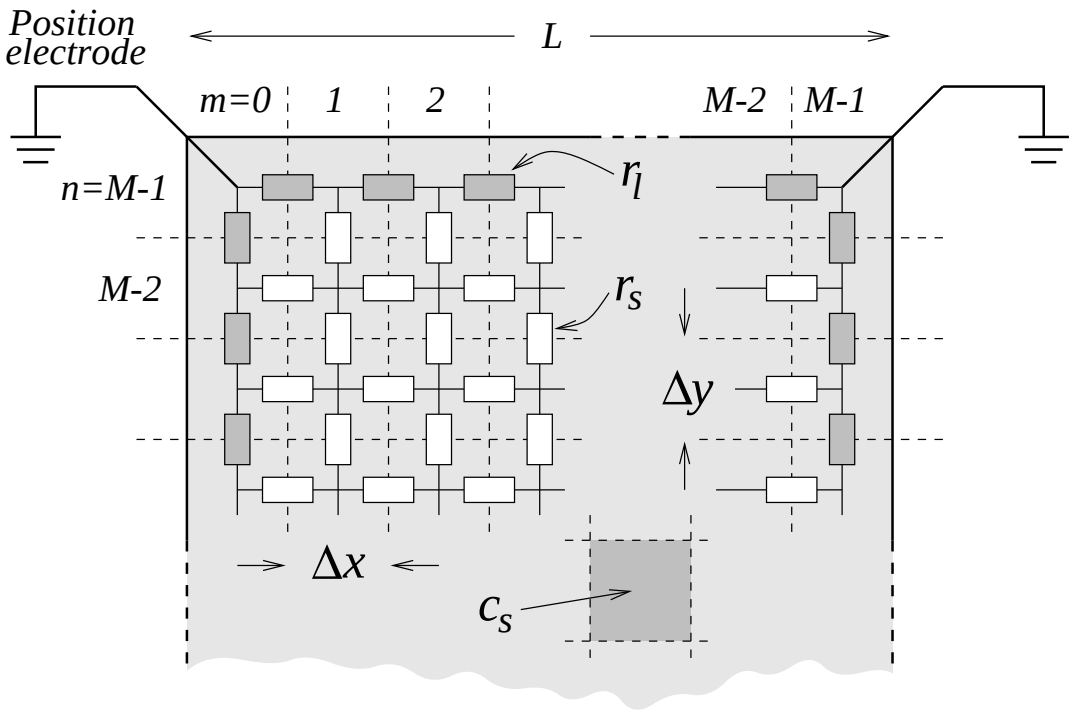
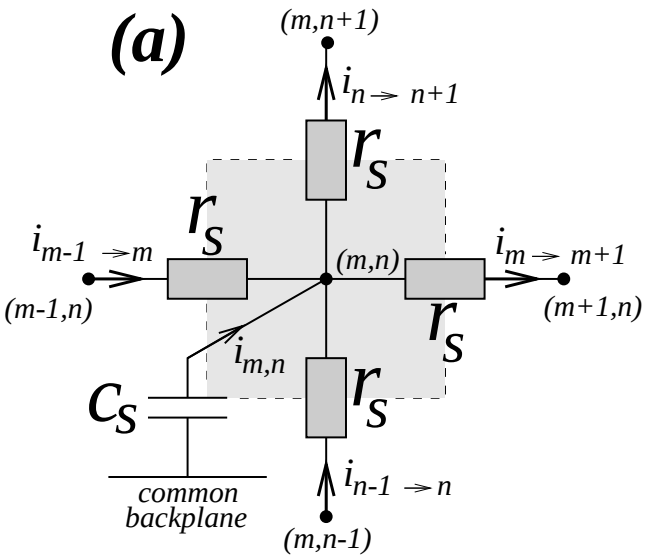
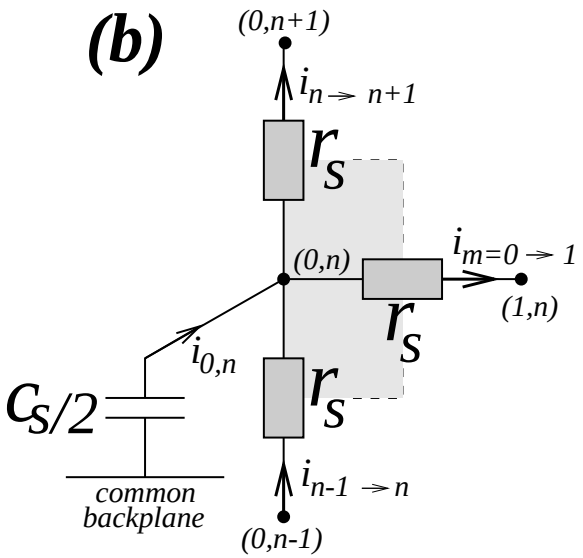
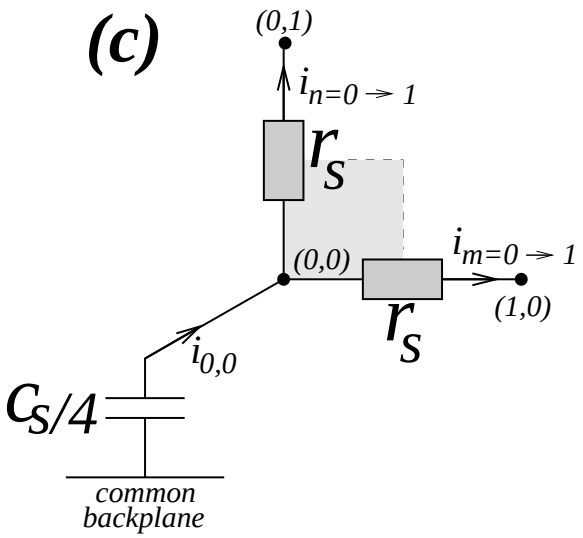

L
I_d
I_c
a
$R_\square$
R_L
I_a
I_b

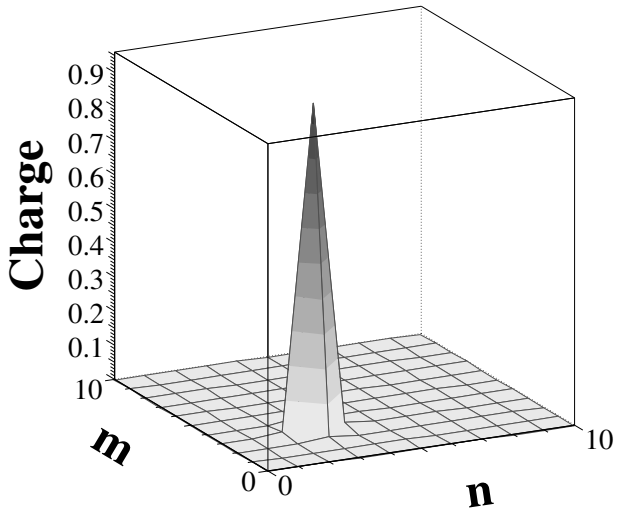

Position
electrode
L
m=0
1
2
M-2
M-1
n=M-1
M-2
r_l
r_s
Δy
Δx
c_s


(a)
(m,n+1)
$i_{n \to n+1}$
r_s
r_s
$i_{m-1 \to m}$
(m,n)
$i_{m \to m+1}$
(m-1,n)
(m+1,n)
r_s
$i_{m,n}$
C_S
r_s
common backplane
$i_{n-1 \to n}$
(m,n-1)

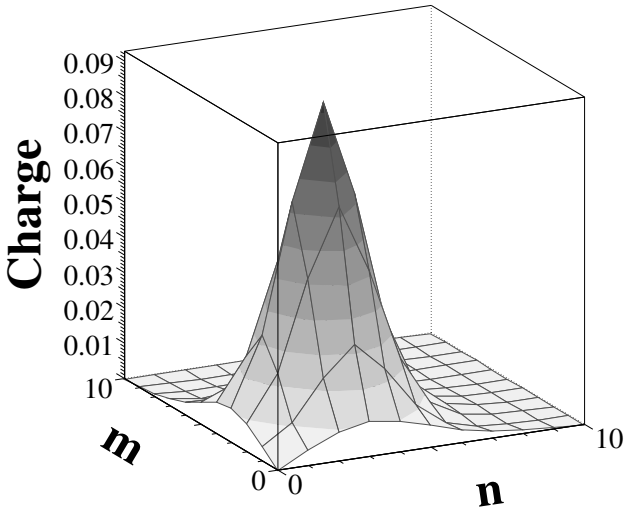

(b)
(0,n+1)
$i_{n \to n+1}$
r_s
$i_{m=0 \to 1}$
(0,n)
(1,n)
r_s
$i_{0,n}$
$C_S/2$
r_s
common backplane
$i_{n-1 \to n}$
(0,n-1)


(c)
(0,1)
$i_{n=0 \to 1}$
r_s
$i_{m=0 \to 1}$
(0,0)
(1,0)
r_s
$i_{0,0}$
$C_S/4$
common backplane

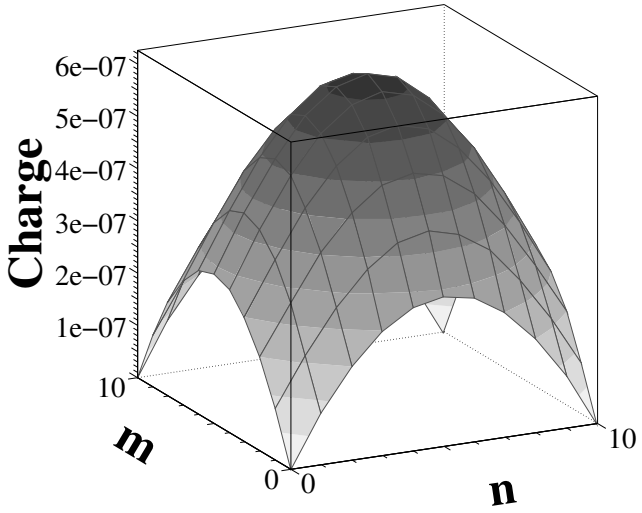
(a)

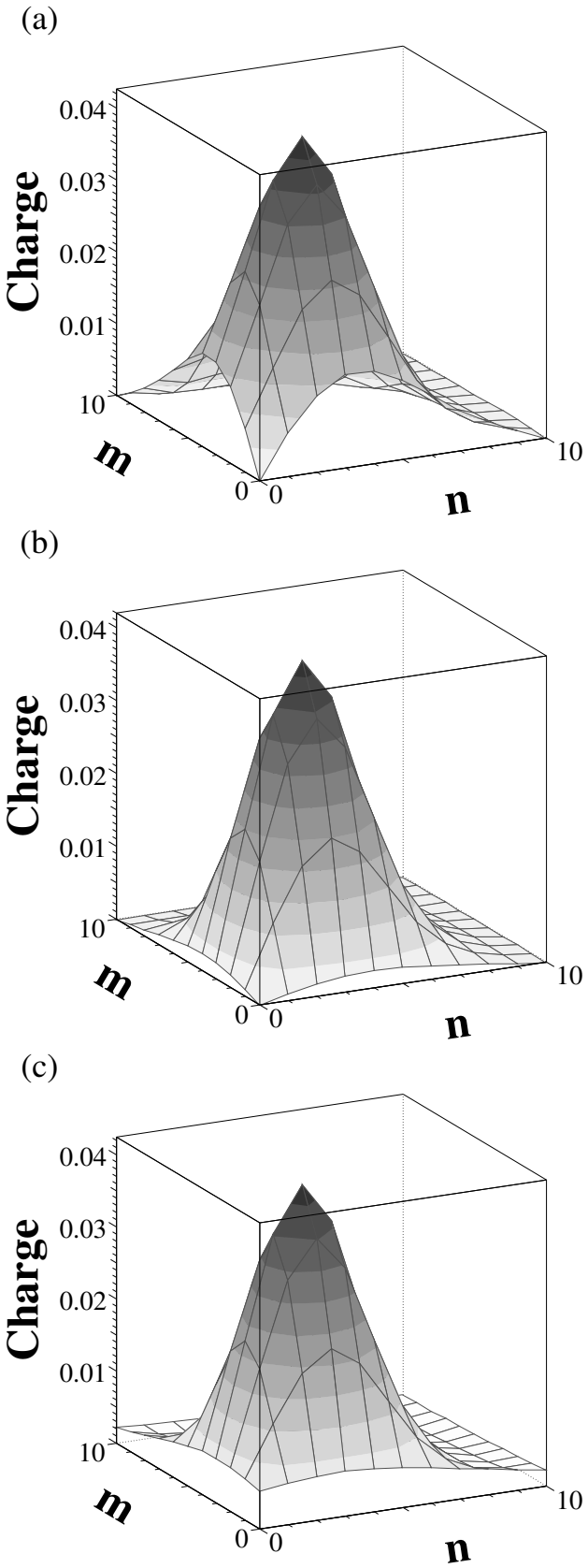

Charge
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
10
m
0
0
10
n

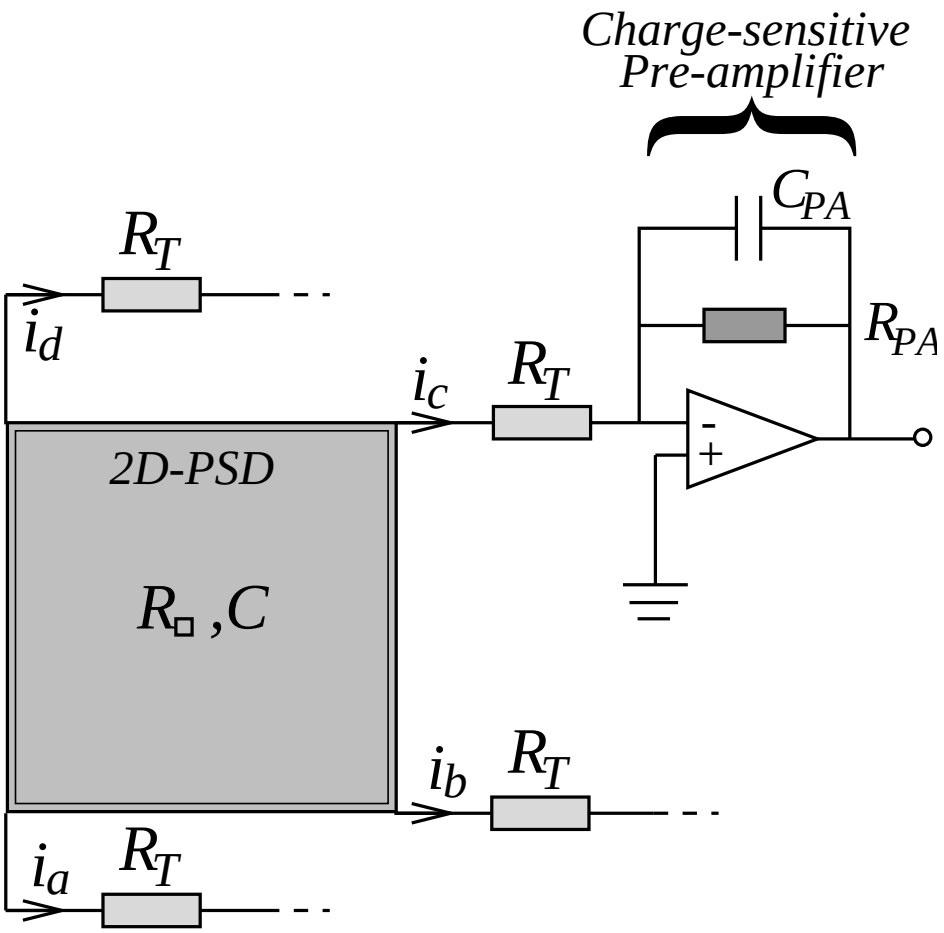
(b)

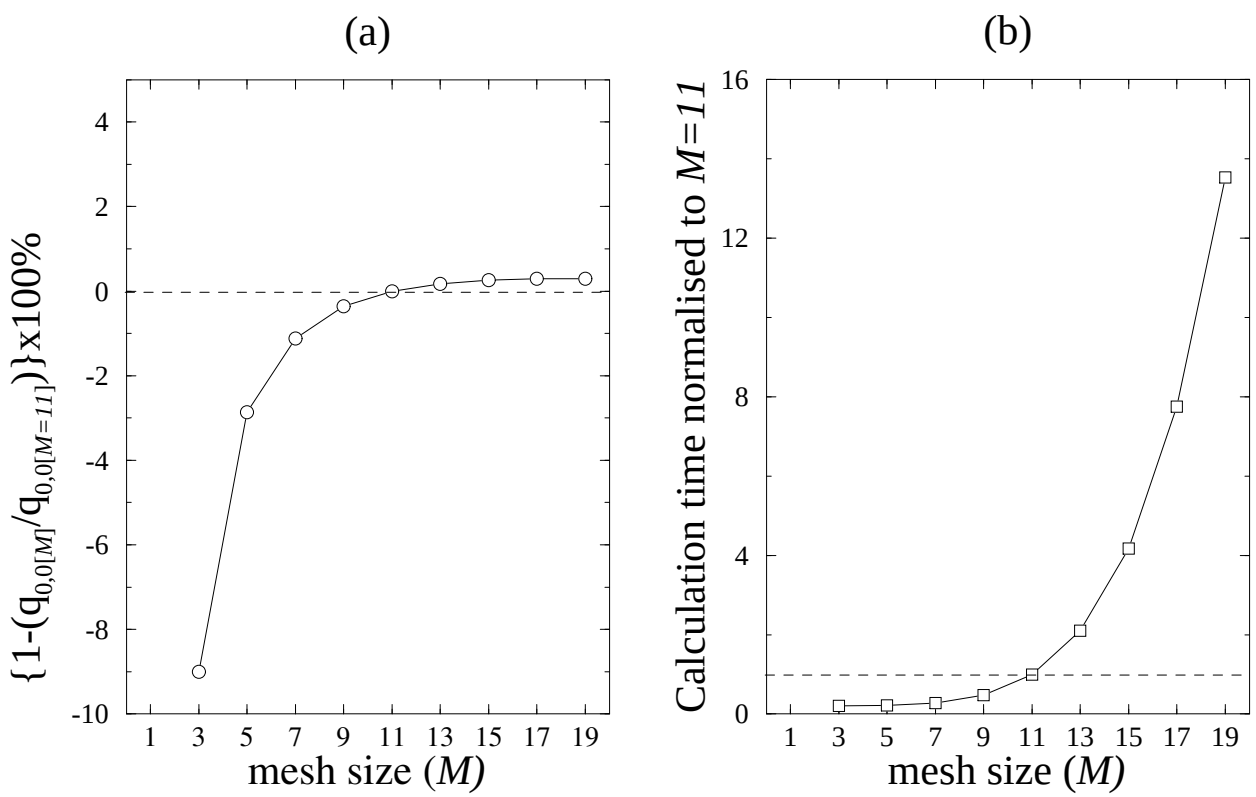

Charge
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
m
0
0
10
n

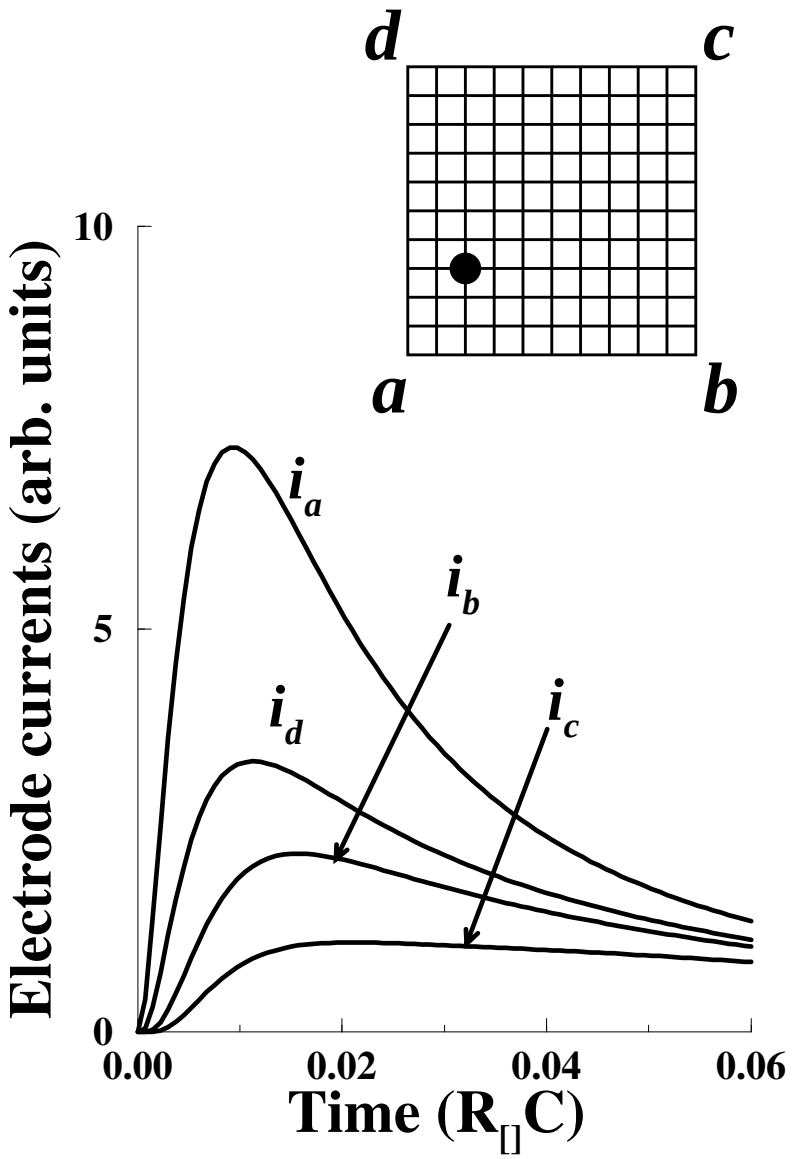
(c)

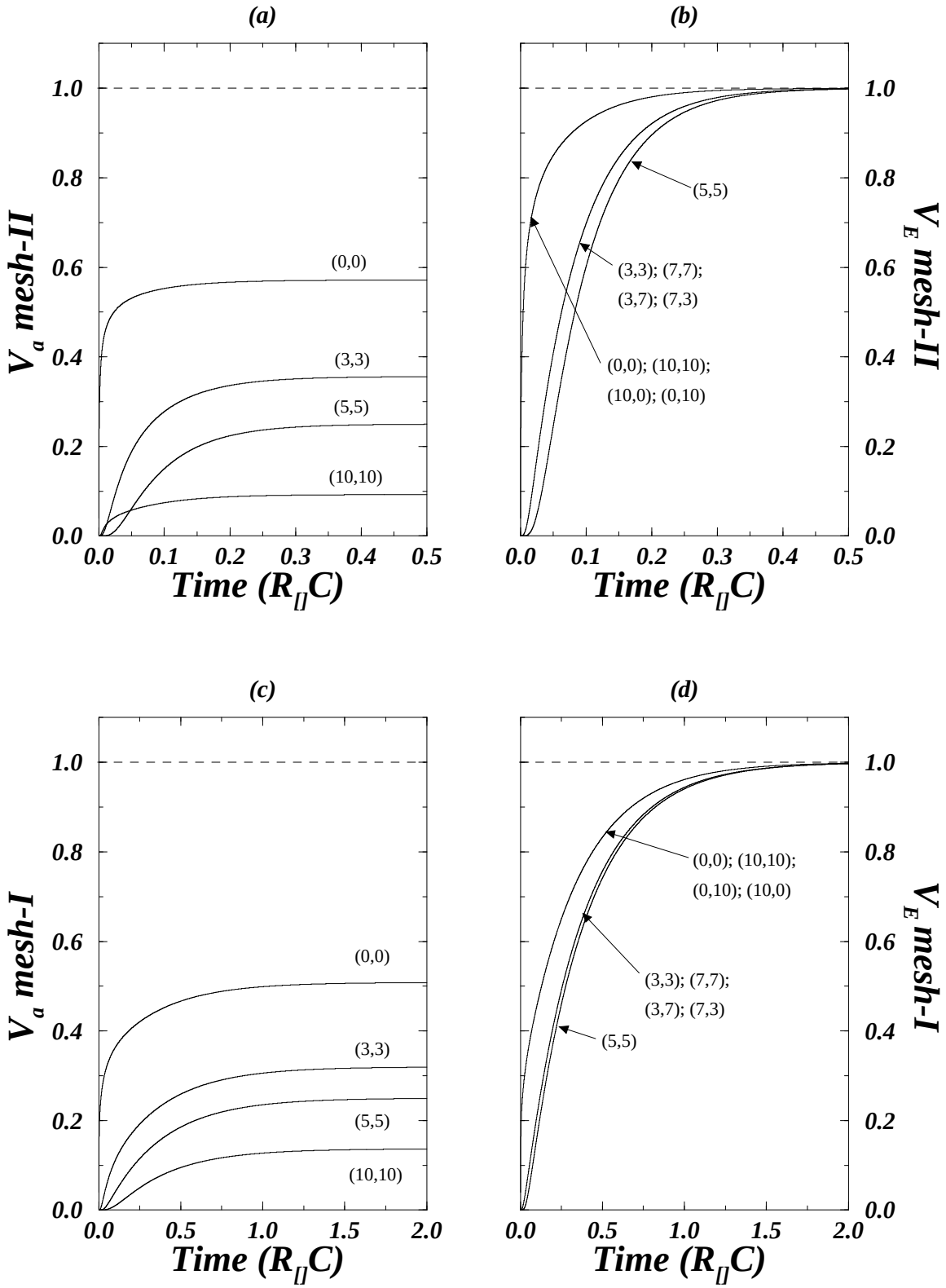

Charge
6e−07
5e−07
4e−07
3e−07
2e−07
1e−07
10
m
0
0
10
n

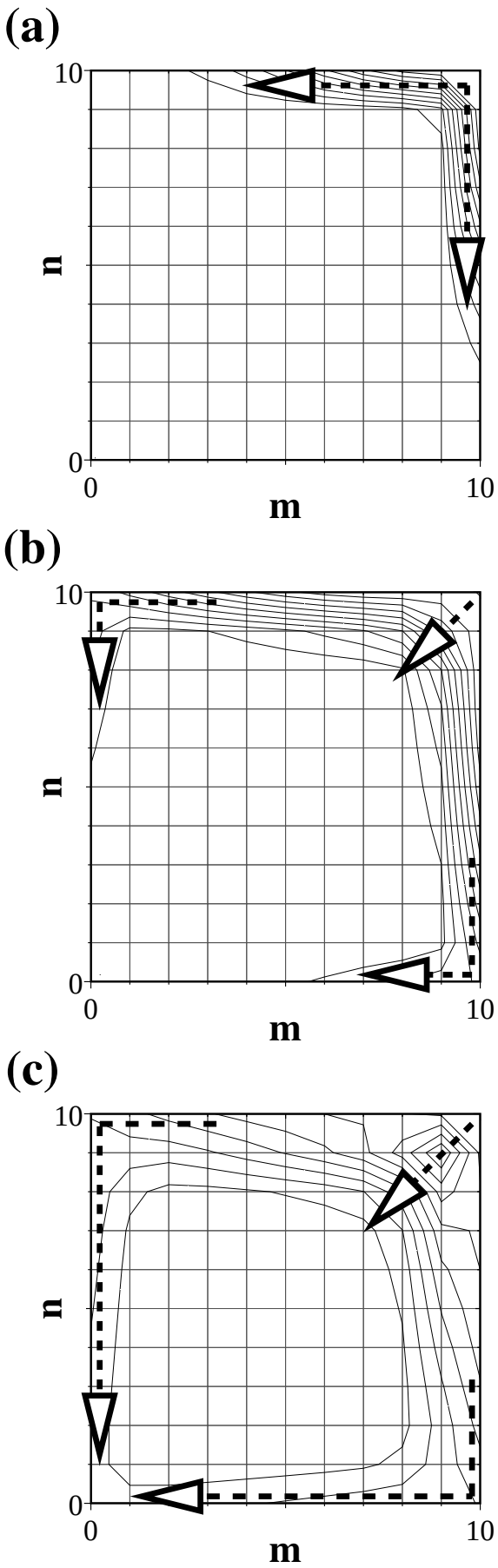

(a)
Charge
0.04
0.03
0.02
0.01
10
m
0
0
n
10
(b)
Charge
0.04
0.03
0.02
0.01
10
m
0
0
n
10
(c)
Charge
0.04
0.03
0.02
0.01
10
m
0
0
n
10

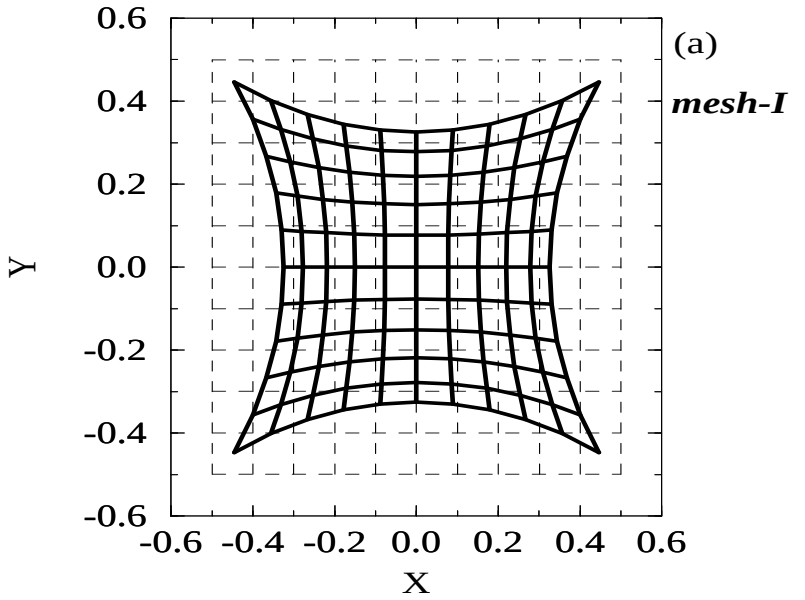

Charge-sensitive
Pre-amplifier
C_{PA}
R_{PA}
R_T
i_d
i_c
R_T
2D-PSD
$R_\square$,C
i_b
R_T
i_a
R_T

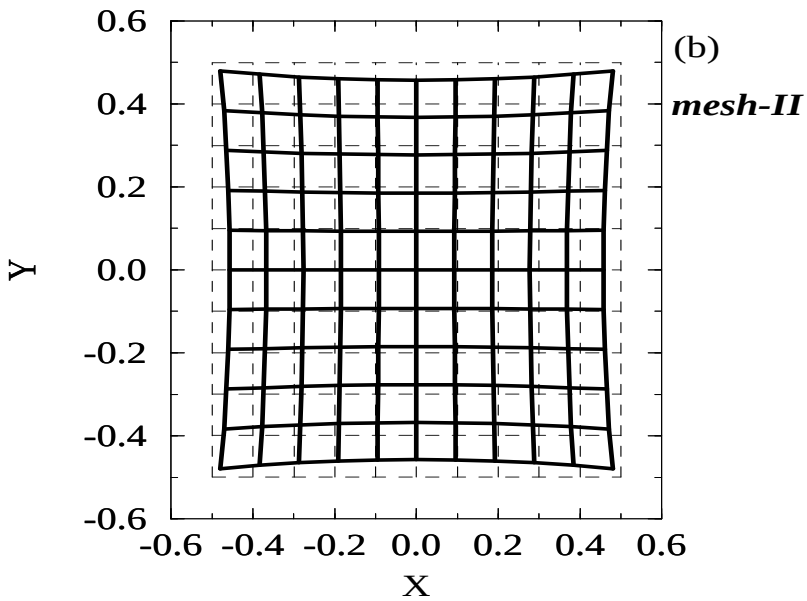

(a)
(b)
{1-(q0,0[M]/q0,0[M=11])}x100%
Calculation time normalised to M=11
mesh size (M)
mesh size (M)
4
2
0
-2
-4
-6
-8
-10
16
12
8
4
0
1 3 5 7 9 11 13 15 17 19
1 3 5 7 9 11 13 15 17 19

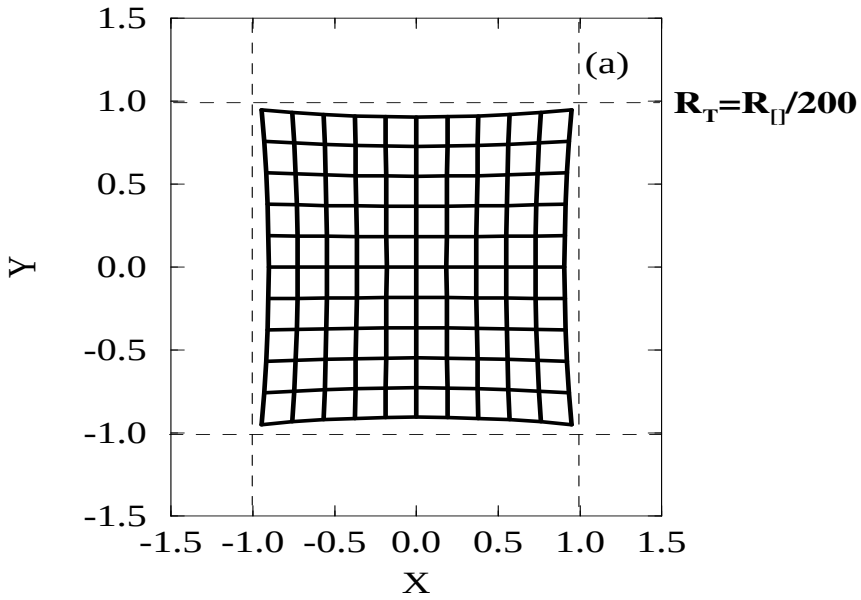

d
c
a
b
10
5
0
Electrode currents (arb. units)
i_a
i_b
i_d
i_c
0.00
0.02
0.04
0.06
Time ($R_{[]}C$)

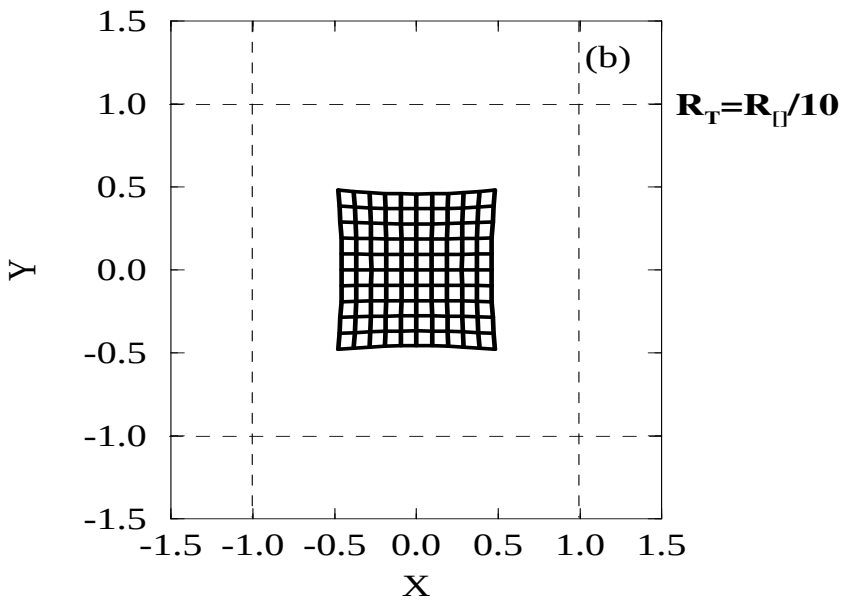

(a)
(b)
(c)
(d)
V_a mesh-II
V_E mesh-II
V_a mesh-I
V_E mesh-I
Time ($R_{[]}C$)
(0,0)
(3,3)
(5,5)
(10,10)
(3,3); (7,7);
(3,7); (7,3)
(0,0); (10,10);
(10,0); (0,10)
(0,0); (10,10);
(0,10); (10,0)
0.0
0.2
0.4
0.6
0.8
1.0
0.1
0.3
0.5
1.5
2.0

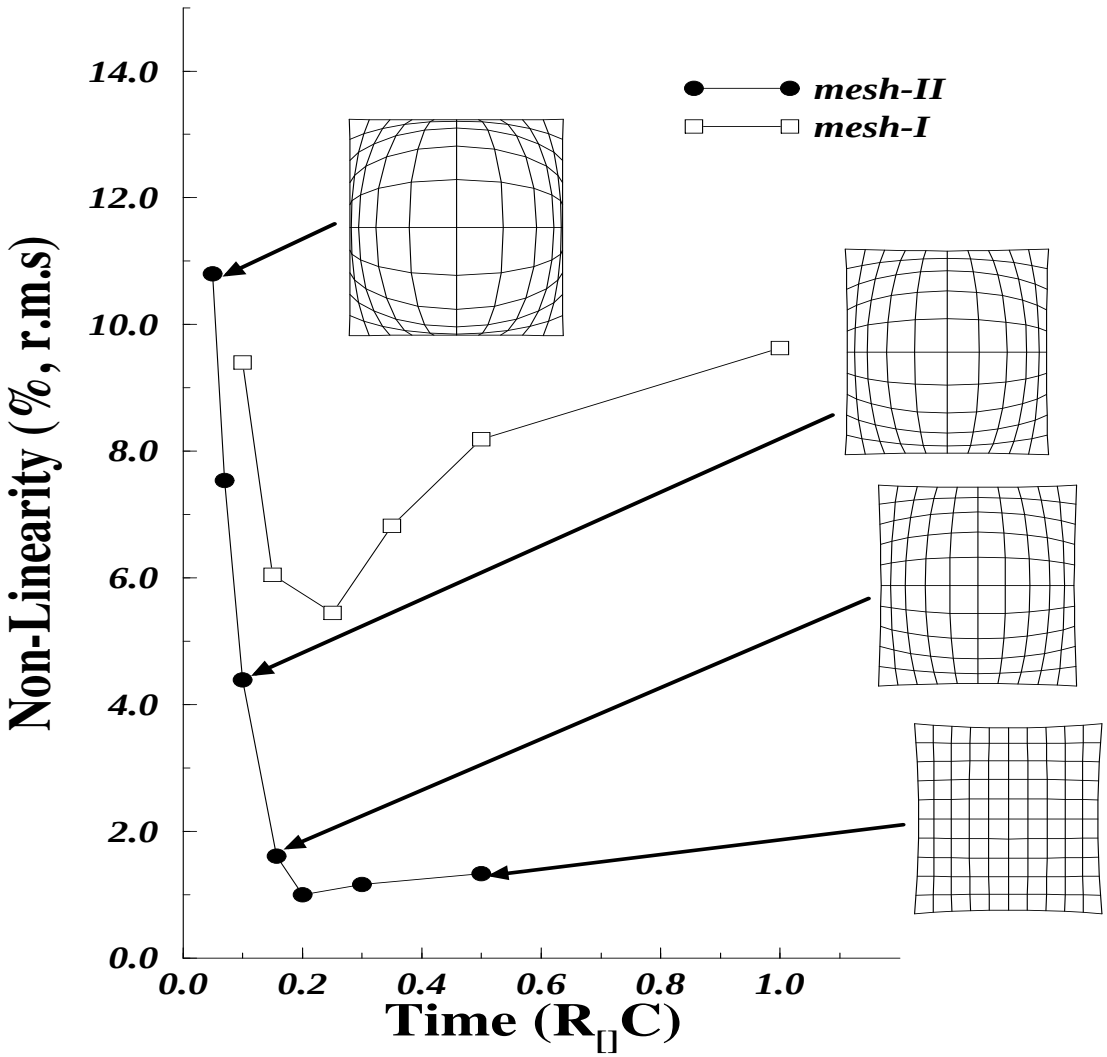

(a)
10
n
0
0
10
m
(b)
10
n
0
0
10
m
(c)
10
n
0
0
10
m


0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
Y
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6
X
(a)
mesh-I

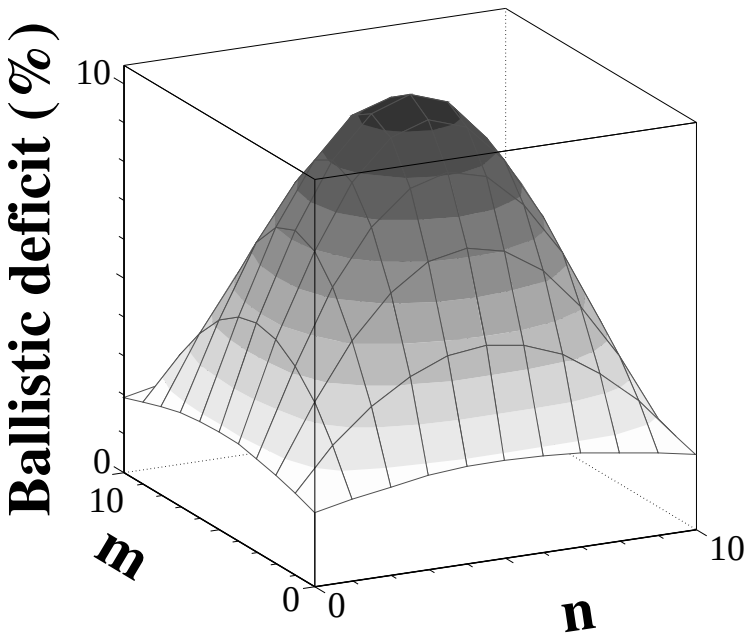

0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
Y
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6
X
(b)
mesh-II


(a)
$R_T=R_{[]}/200$
Y
X
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-1.5 -1.0 -0.5 0.0 0.5 1.0 1.5

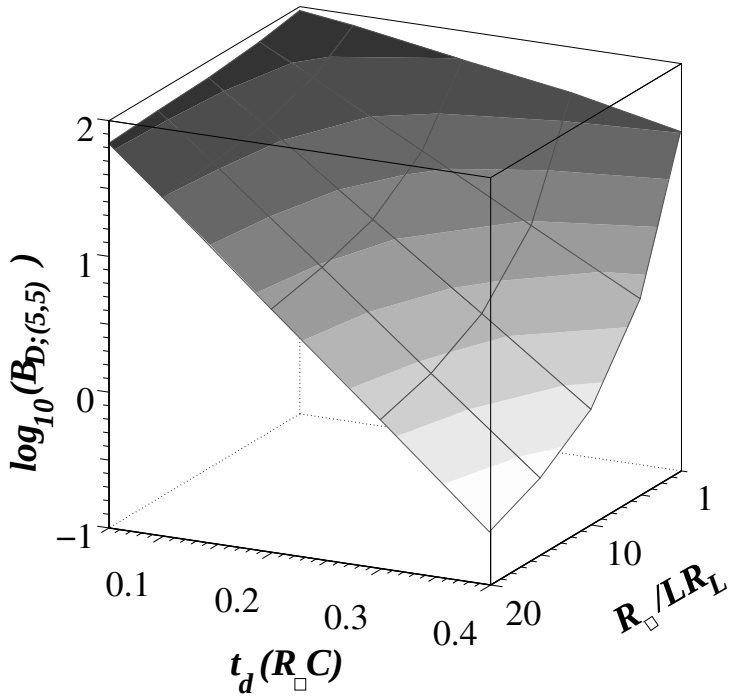

(b)
$R_T=R_{[]}/10$
Y
X
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-1.5 -1.0 -0.5 0.0 0.5 1.0 1.5


mesh-II
mesh-I
Non-Linearity (%, r.m.s)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Time (R[]C)

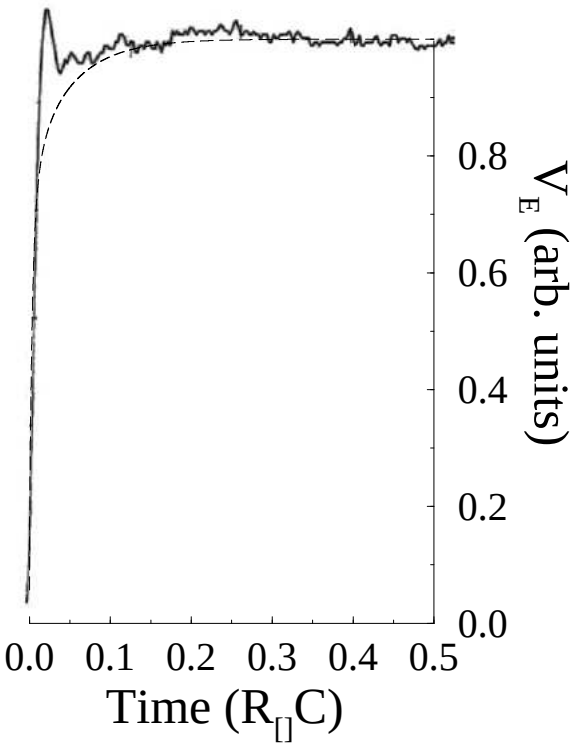
(a)


Ballistic deficit (%)
10
0
10
m
0
0
n
10

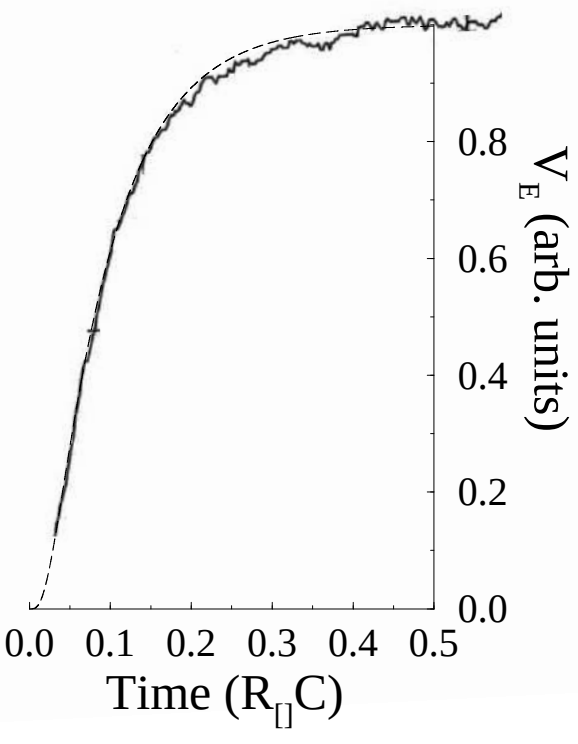
(b)


2
1
0
−1
log10(BD;(5,5))
0.1
0.2
0.3
0.4
td(R□C)
20
10
1
R□/LRL

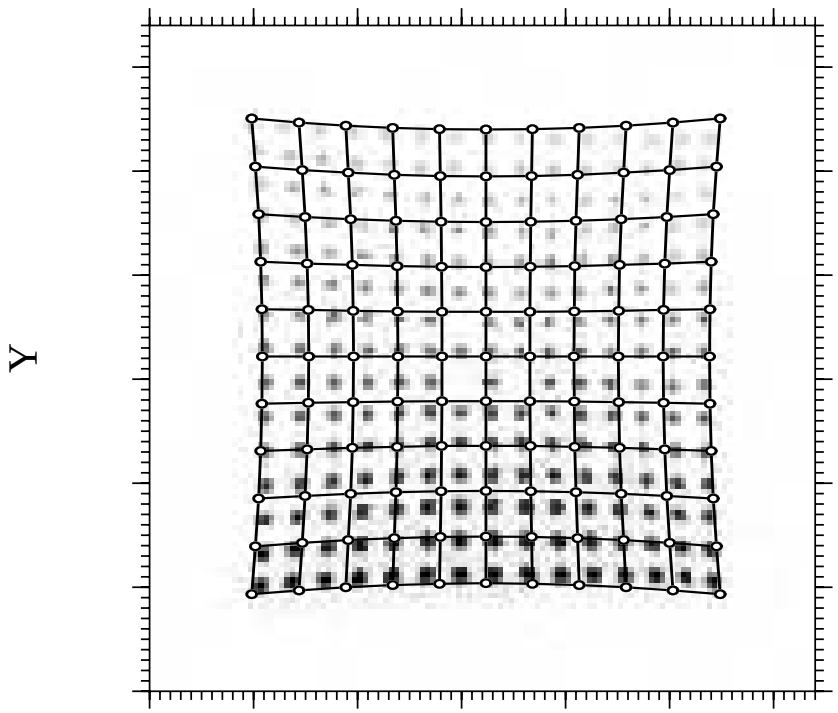
(a)


0.0
0.2
0.4
0.6
0.8
V_E (arb. units)
0.0 0.1 0.2 0.3 0.4 0.5
Time ($R_{[]}C$)

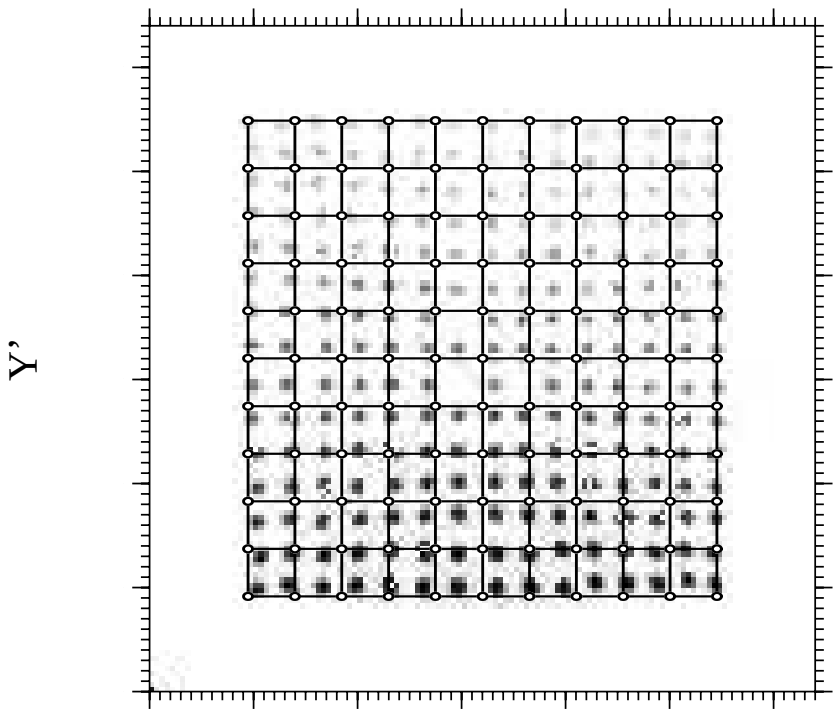
(b)


0.0
0.2
0.4
0.6
0.8
V_E (arb. units)
0.0 0.1 0.2 0.3 0.4 0.5
Time ($R_{[]}C$)

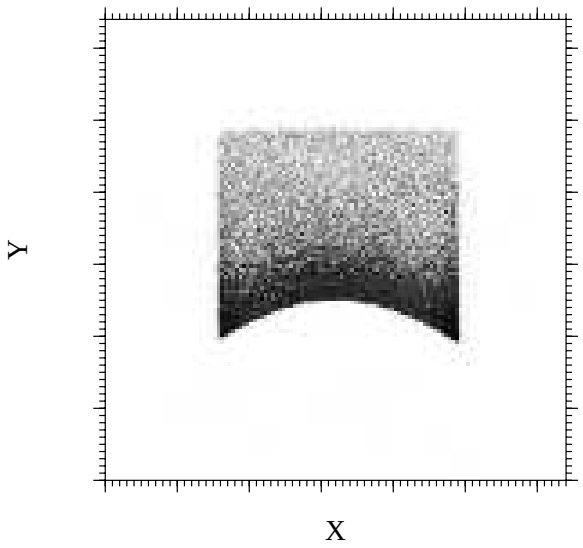
(a)



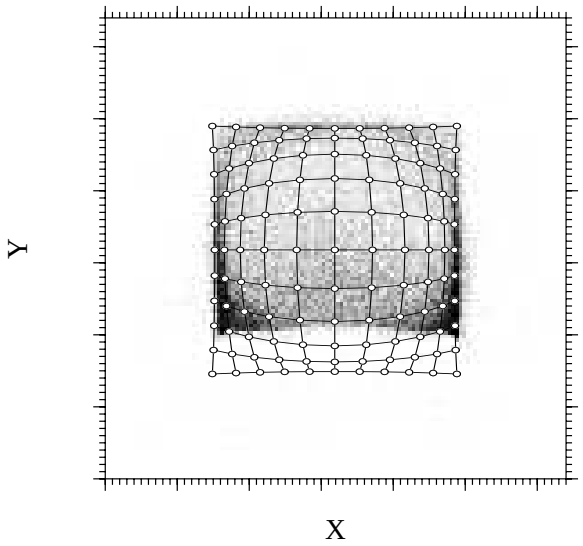
(b)



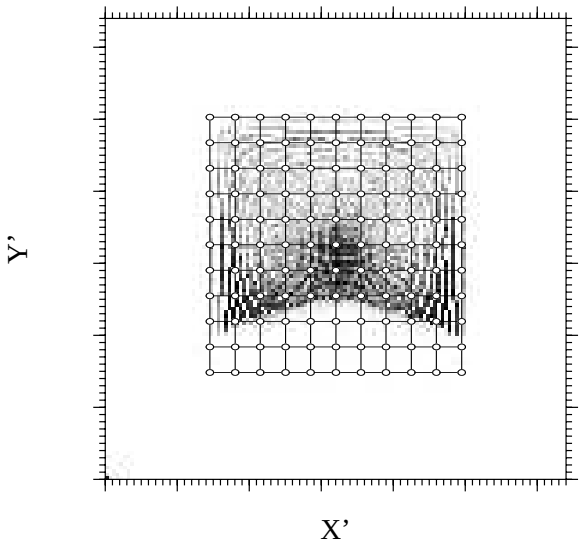
(a)



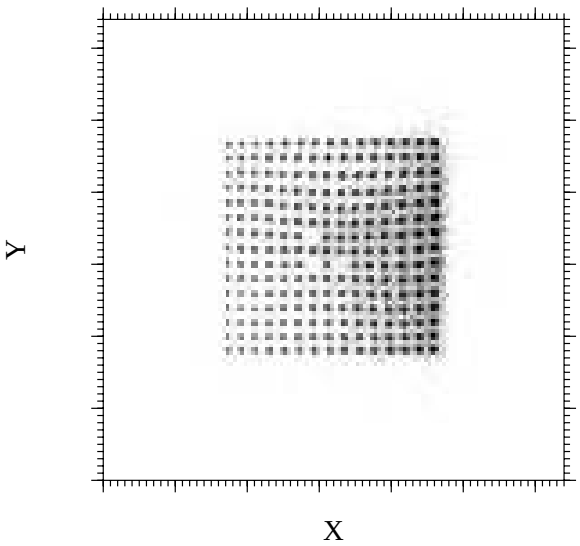
(b)



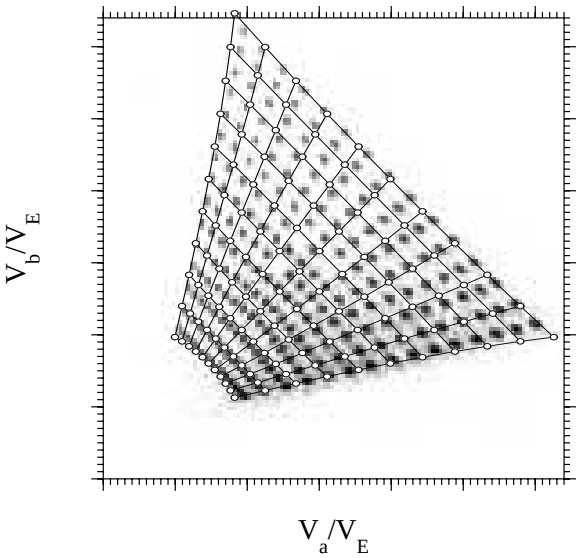
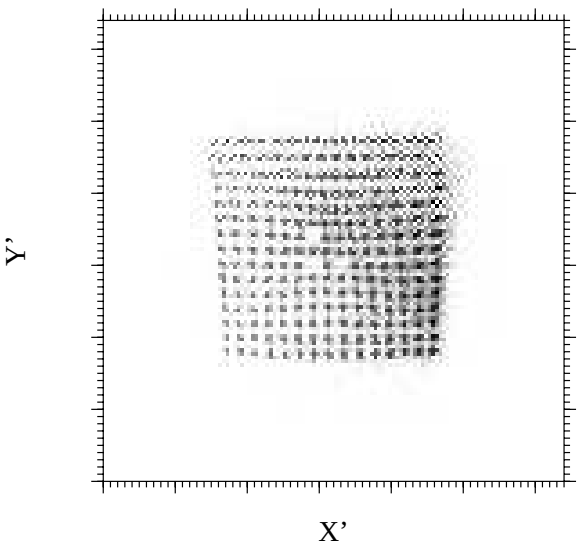
(c)



(a)



(b)



(c)