

Tue Jun 16 21:27:20 2015  
# Warp  
# Origin date: Mon, 15 Jun 2015 10:37:03 -0700  
# Local date: Mon, 15 Jun 2015 10:37:03 -0700  
# Commit hash: d880557  
# /usr/lib64/python2.7/site-packages/warp/warp.pyc  
# /usr/lib64/python2.7/site-packages/warp/warpC.so  
# Tue Jun 16 21:27:20 2015

Version: git-b3cc0cc  
ESQ model

Arun Persaud (apersaud@lbl.gov), Tue Jun 16 21:27:20 2015 esq.028

Atomic number of ion = 1.3129e+02  
 Charge state of ion = 1.0000e+00  
 Initial X, Y emittances = 0.0000e+00, 0.0000e+00 m-rad  
 Initial X, Y envelope radii = 2.5000e-05, 2.5000e-05 m  
 Initial X, Y envelope angles = 0.0000e+00, 0.0000e+00 rad  
 Input beam current = 2.0000e-05 amps  
 Current density = 1.0186e+04 amps/m\*\*2  
 Charge density = 5.9410e-02 Coul/m\*\*3  
 Number density = 3.7081e+17  
 Plasma frequency = 7.0221e+07 1/s  
     times dt = 7.0221e-04  
     times quad period = 0.0000e+00  
 Plasma period = 8.9478e-08 s  
 X-, Y-Thermal Velocities = 0.0000e+00, 0.0000e+00 m/s  
     times dt = 0.0000e+00, 0.0000e+00 m  
     times dt/dx, dt/dy (X, Y) = 0.0000e+00, 0.0000e+00  
 X-, Y-Debye Wavelengths = 0.0000e+00, 0.0000e+00 m  
     over dx, dy (X and Y) = 0.0000e+00, 0.0000e+00  
 Longitudinal thermal velocity (rms) = 0.0000e+00 m/s  
     times dt = 0.0000e+00 m  
     times dt/dz = 0.0000e+00  
 Longitudinal Debye wavelength = 0.0000e+00 m  
     over dz = 0.0000e+00

Step 0, T = 0.0000e+0 s, Zbeam = 0.0000e+0 m  
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Beam velocity =  $1.7145 \times 10^5$  m/s  
 over c =  $5.7190 \times 10^{-4}$   
 Kinetic energy =  $2.0000 \times 10^4$  eV  
 Weight of simulation particles =  $4.1610 \times 10^0$   
 Number of simulation particles = 300  
 Number of real particles =  $1.2483 \times 10^3$   
 Total mass =  $2.7215 \times 10^{-22}$  kg  
 Total charge =  $2.0000 \times 10^{-16}$  Coul  
 Generalized perveance =  $5.2421 \times 10^{-5}$   
 Characteristic current =  $4.0794 \times 10^9$  amps  
 Budker parameter =  $8.5725 \times 10^{-12}$   
 Timestep size dt =  $1.0000 \times 10^{-11}$  s  
 Tune length =  $0.0000 \times 10^0$   
 Undep. X-, Y-Betatron frequencies =  $6.2832 \times 10^{36}$ ,  $6.2832 \times 10^{36}$  1/s  
 Undep. X-, Y-Betatron periods =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$  s  
 Undep. X-, Y-Betatron wavelengths =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$  m  
 Dep. X-, Y-Betatron frequencies =  $6.2832 \times 10^{36}$ ,  $6.2832 \times 10^{36}$  1/s  
 Dep. X-, Y-Betatron periods =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$  s  
 Dep. X-, Y-Betatron wavelengths =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$  m  
 X-, Y-Tune Depressions (sigma/sigma0) =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$   
 Space charge wave velocity =  $2.4031 \times 10^3$  m/s  
 Effective wall radius =  $1.0607 \times 10^{-3}$  m  
 Geometric factor =  $7.4955 \times 10^0$   
 X-, Y-Emittance over Space charge forces =  $0.0000 \times 10^0$ ,  $0.0000 \times 10^0$

Step 0, T =  $0.0000 \times 10^0$  s, Zbeam =  $0.0000 \times 10^0$  m  
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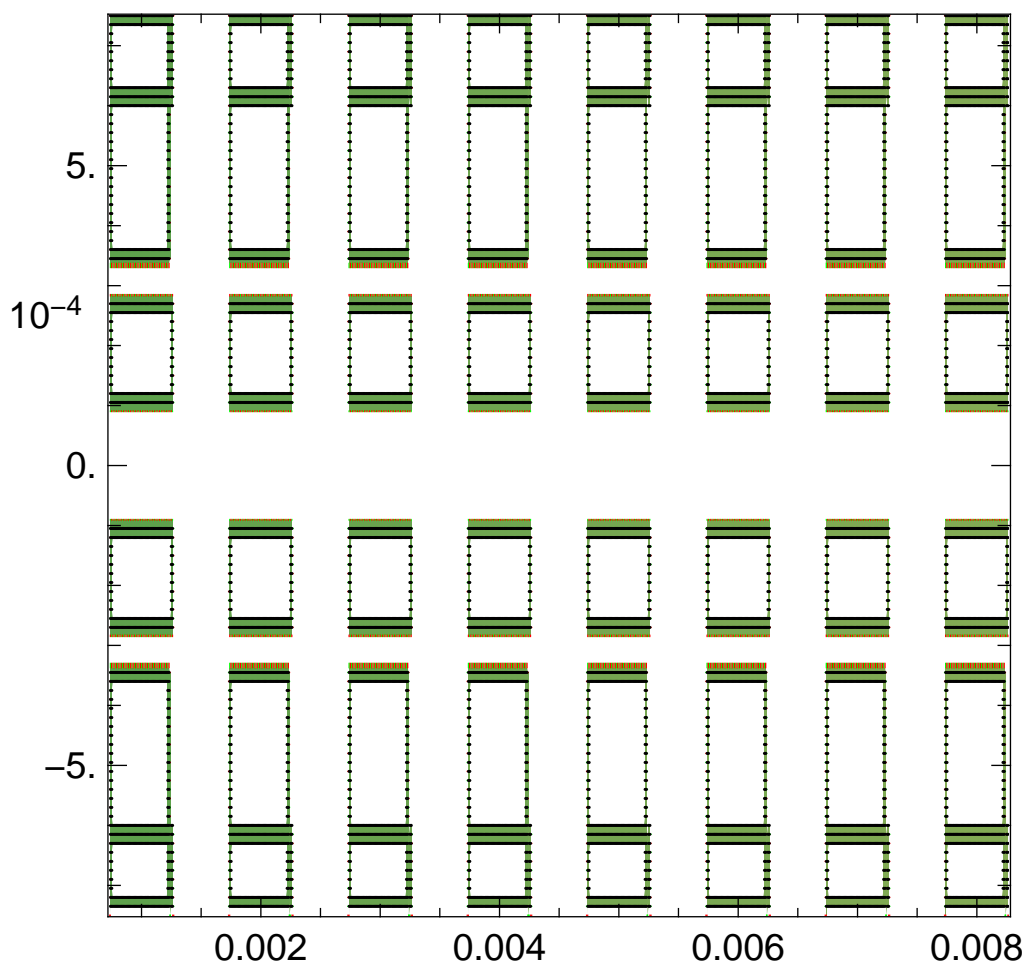
Particle distribution = none  
Number of grid points in x = 100  
Number of grid points in y = 100  
Number of grid points in z = 999  
Grid spacing in x =  $1.5000\text{e-}05$  m  
Grid spacing in y =  $7.5000\text{e-}06$  m  
Grid spacing in z =  $1.0000\text{e-}05$  m  
Grid extends in x from  $-7.5000\text{e-}04$  to  $7.5000\text{e-}04$  m  
Grid extends in y from  $0.0000\text{e+}00$  to  $7.5000\text{e-}04$  m  
Grid extends in z from  $0.0000\text{e+}00$  to  $9.9900\text{e-}03$  m  
Two fold symmetry  
Geometry is 3-D

Step 0, T =  $0.0000\text{e+}0$  s, Zbeam =  $0.0000\text{e+}0$  m  
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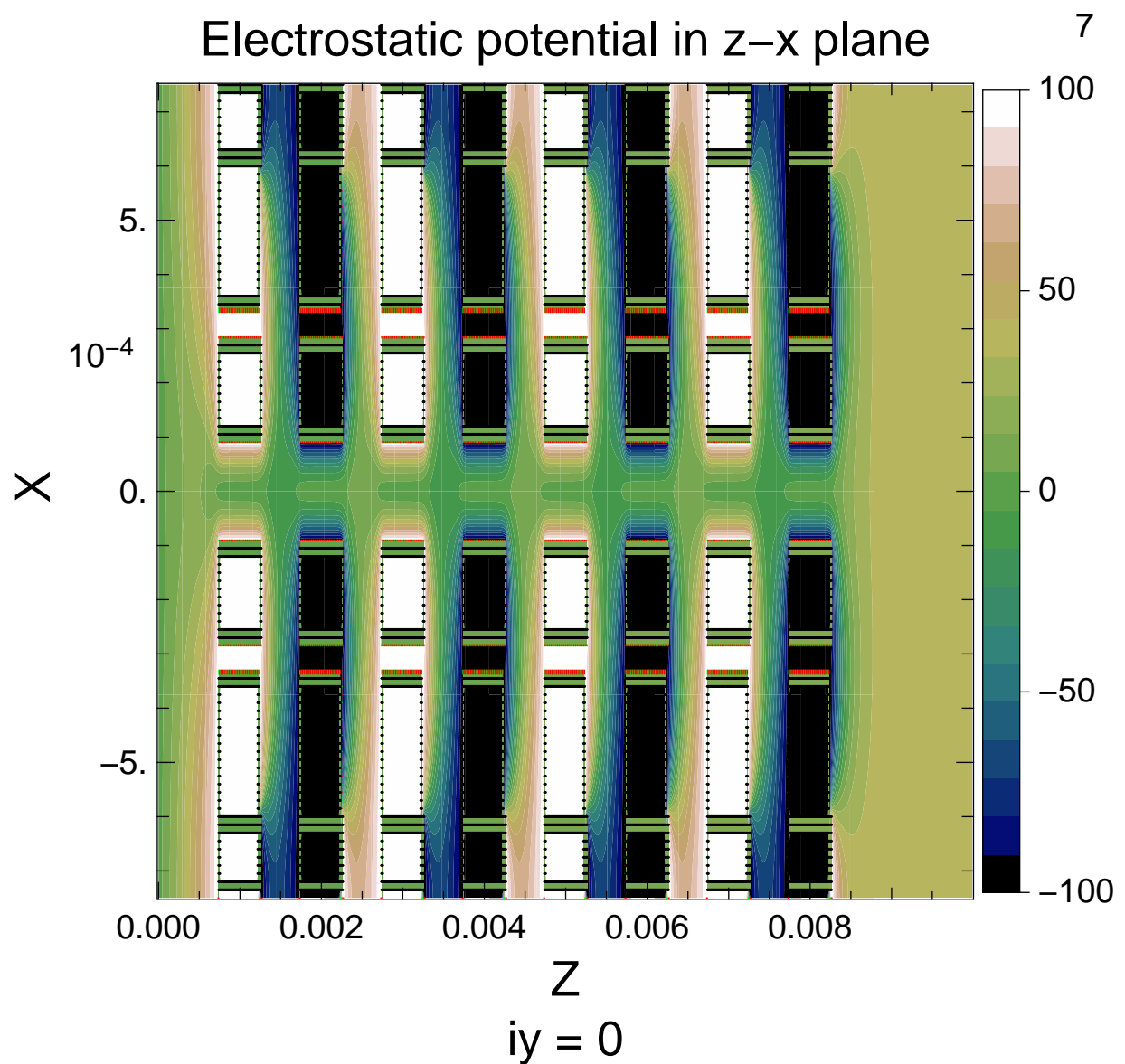
Step 0, T = 0.0000e+0 s, Zbeam = 0.0000e+0 m  
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Step 0,  $T = 0.0000e+0$  s,  $Z_{\text{beam}} = 0.0000e+0$  m  
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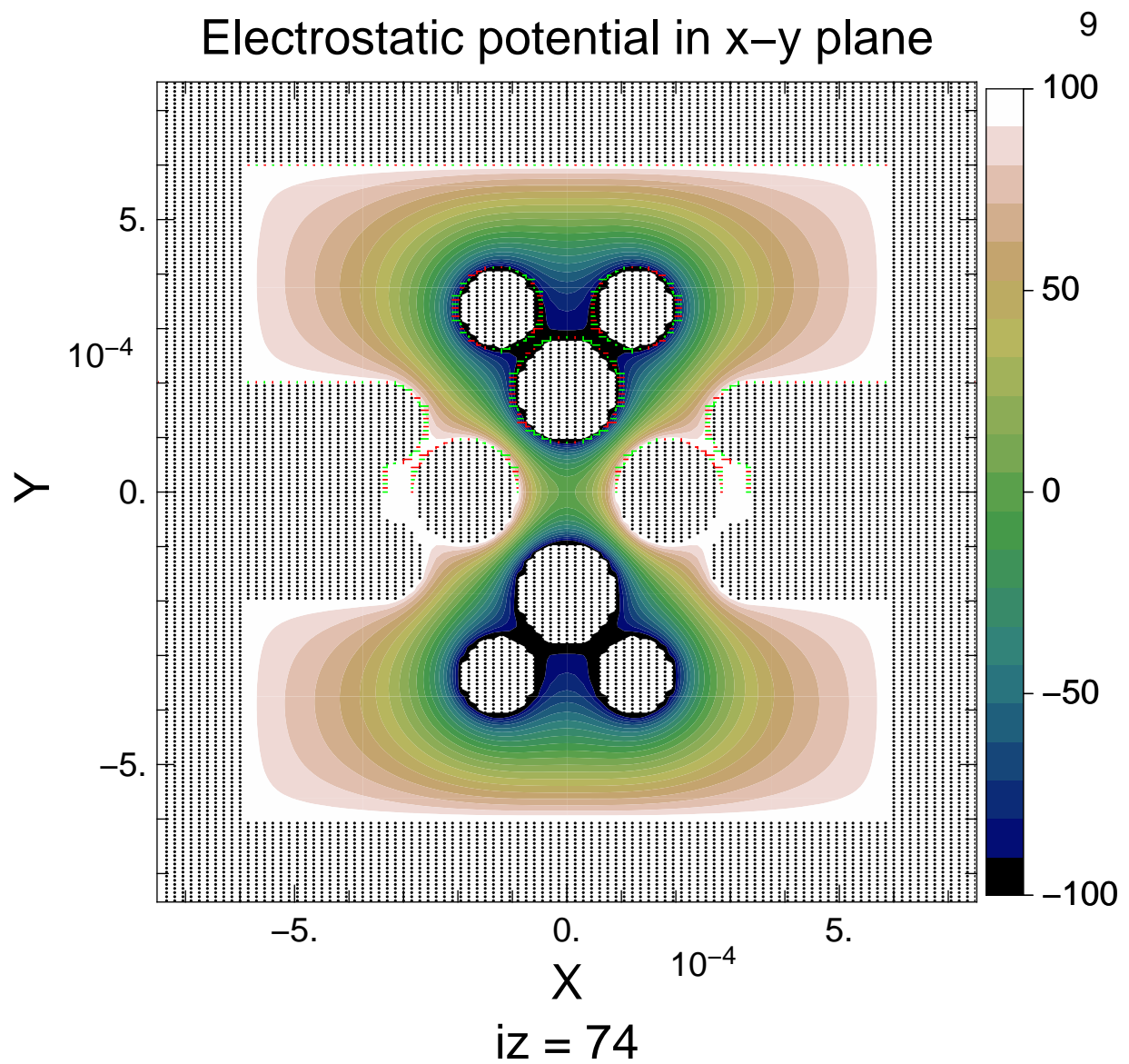
Step 0,  $T = 0.0000e+0$  s,  $Z_{\text{beam}} = 0.0000e+0$  m  
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Step 0, T = 0.0000e+0 s, Zbeam = 0.0000e+0 m  
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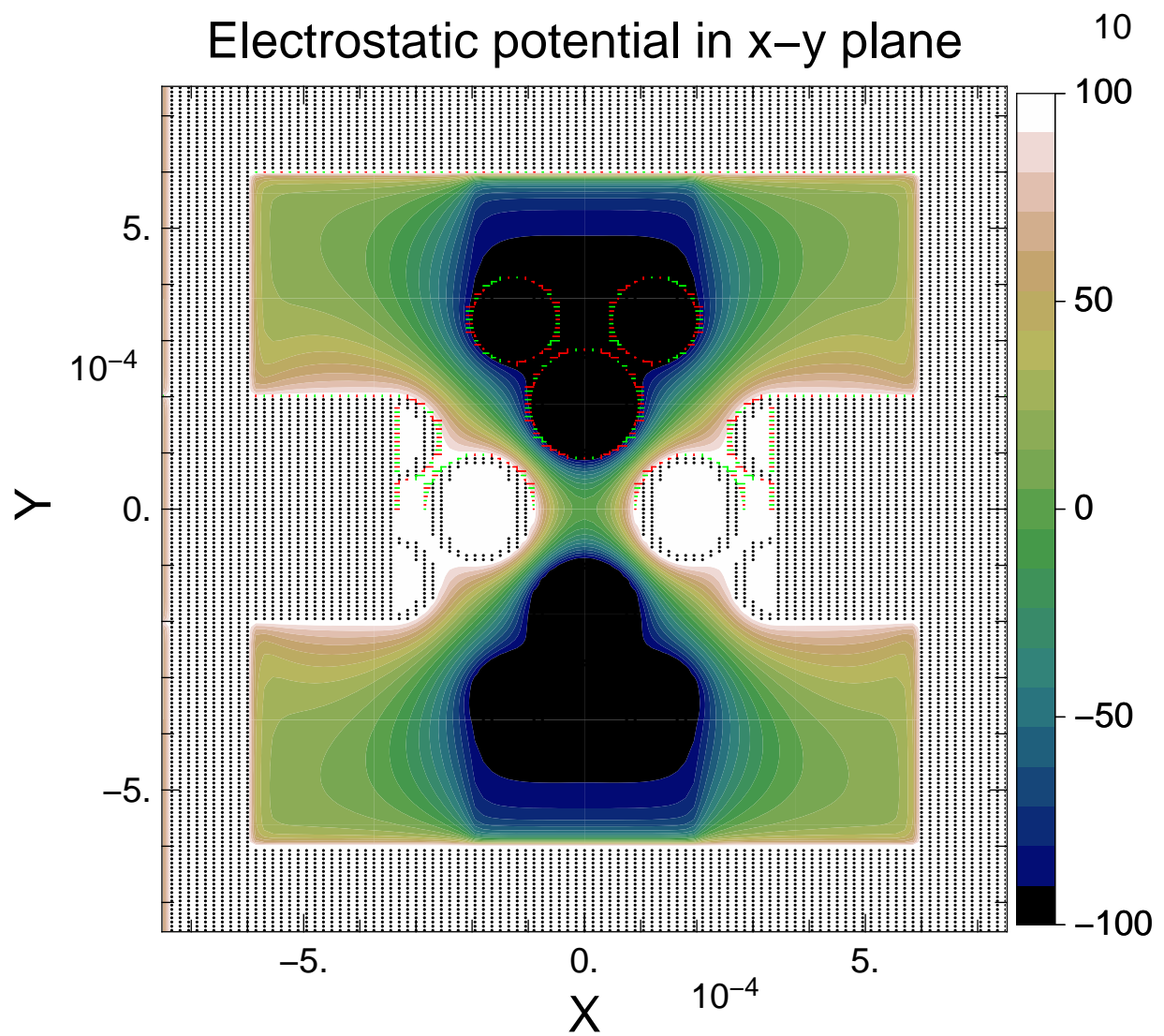
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Step 0,  $T = 0.0000e+0$  s,  $Z_{\text{beam}} = 0.0000e+0$  m  
 Version: git-b3cc0cc  
 ESQ model

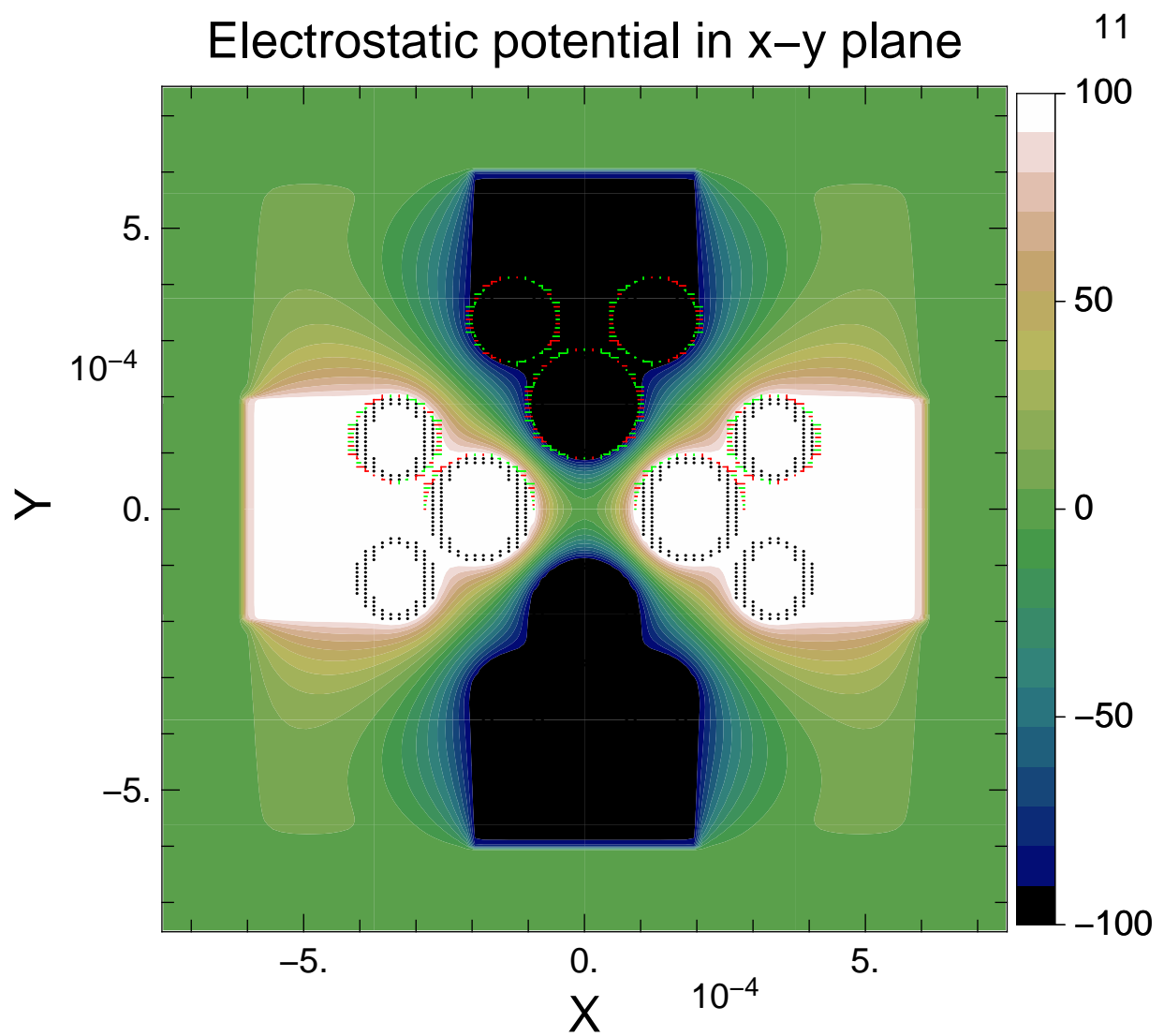
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iz = 123

Step 0, T = 0.0000e+0 s, Zbeam = 0.0000e+0 m  
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ESQ model

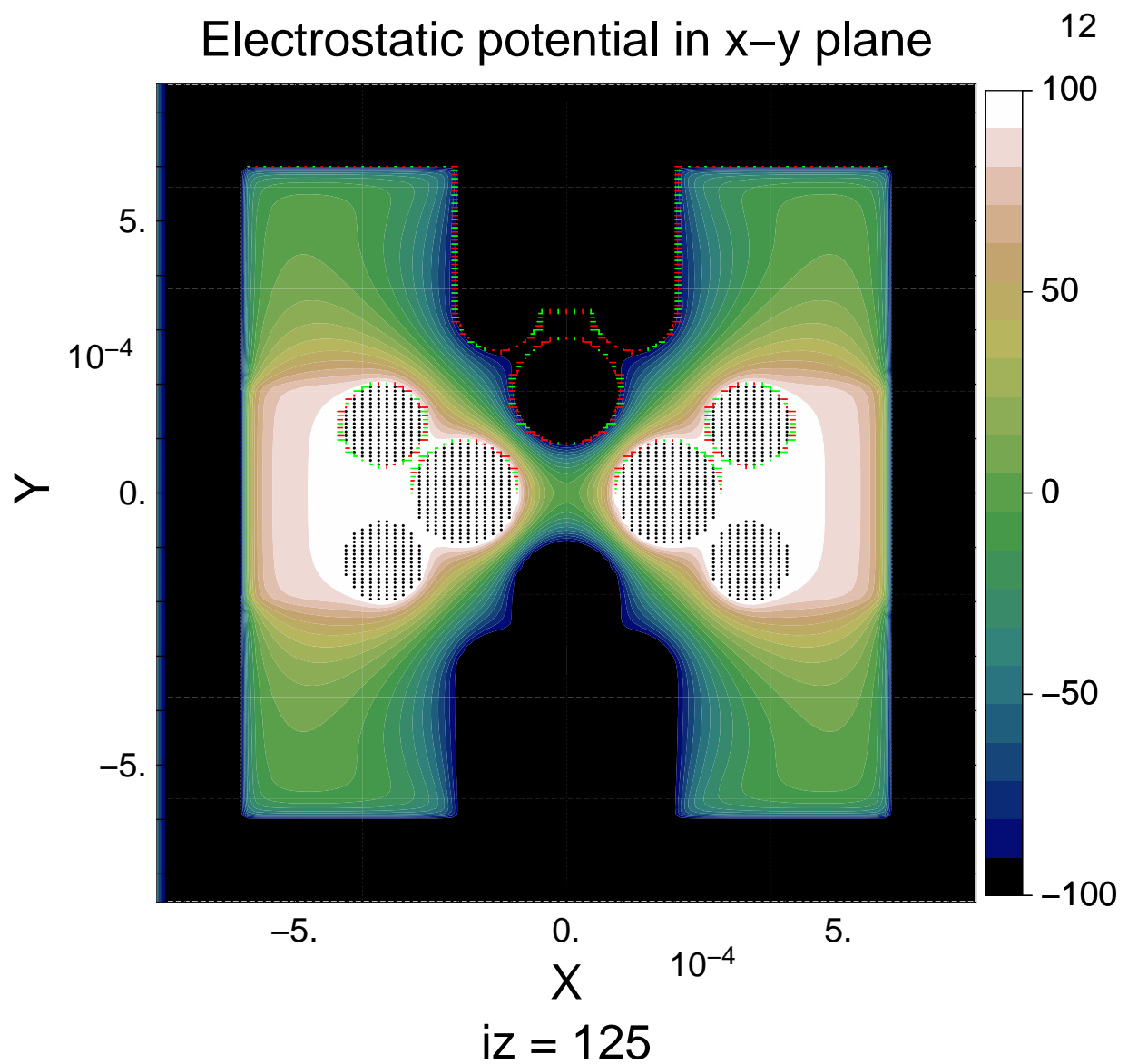
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$iz = 124$

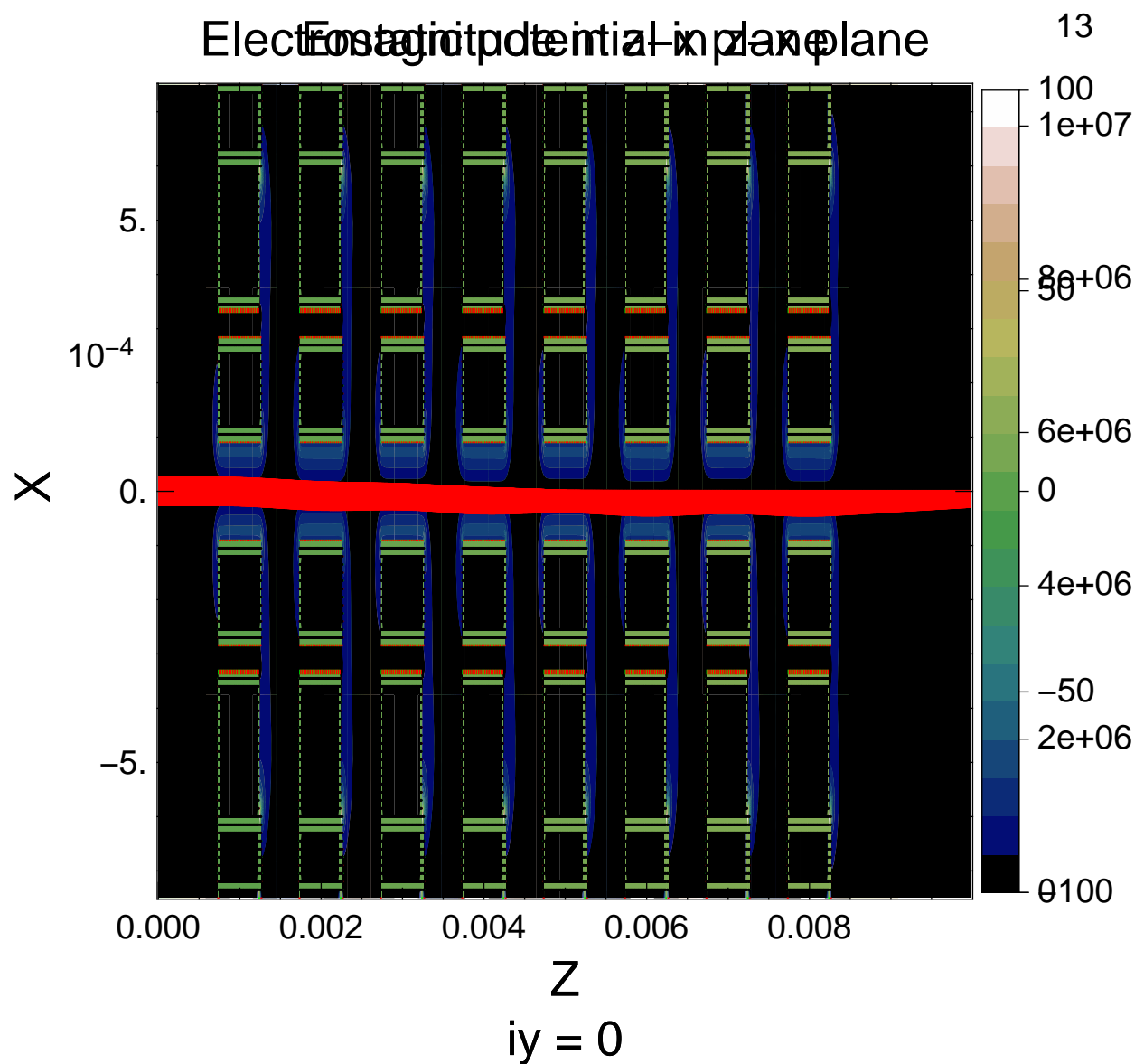
Step 0,  $T = 0.0000e+0$  s,  $Z_{\text{beam}} = 0.0000e+0$  m  
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Step 1,  $T = 20.0000e-9$  s,  $Z_{beam} = 0.0000e+0$  m  
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Step 2,  $T = 20.0100e-9$  s,  $Z_{\text{beam}} = 0.0000e+0$  m  
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