Alek Pensky _ mygeom

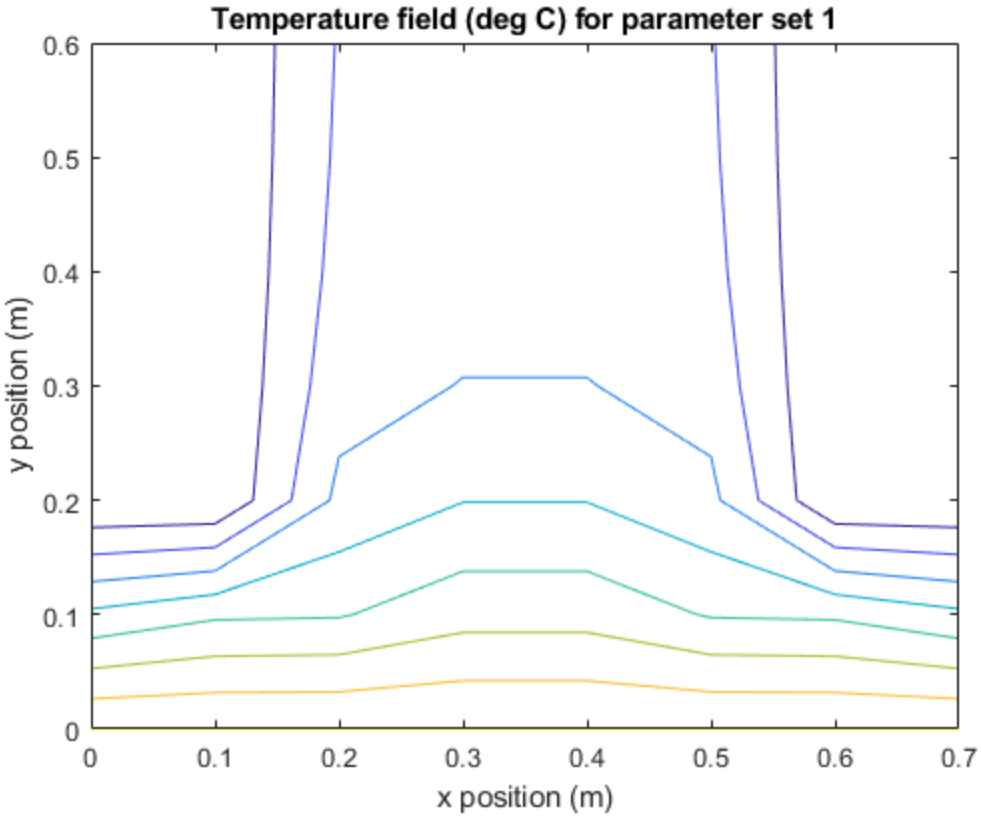
```
clc
clear all

global k h1 h2 Tinf1 Tinf2 Tb dx
dx=0.1;
Tb=400;

count=1;
for v = [1 2 3]

    if v==1
        k=10;
        h1=100;
        h2=100;
        Tinf1= 100;
        Tinf2= 100;
    end
    if v==2
        k=10;
        h1=125;
        h2=125;
        Tinf1= 125;
        Tinf2= 125;
    end
    if v==3
        k=10;
        h1=125;
        h2=75;
        Tinf1= 100;
        Tinf2= 100;
    end

    guess =
[78,200,78,500,78,200,78,200,78,500,78,200,78,200,78,500,78,200,78,200,78,500,78,
    root = fsolve(@my_geom_fun1,guess);
    root

    Tb=400;
    Tinf=100;
    x = linspace(0,.7,8);
    y = linspace(0,.6,7);
    [x1,y1] = meshgrid(x,y);

    z=[Tb Tb Tb Tb Tb Tb Tb Tb;
        root(1) root(2) root(3) root(4) root(5) root(6) root(7)
root(8);
        0 0 root(9) root(10) root(11) root(12) 0 0;
        0 0 root(13) root(14) root(15) root(16) 0 0;
        0 0 root(17) root(18) root(19) root(20) 0 0;
        0 0 root(21) root(22) root(23) root(24) 0 0;
```

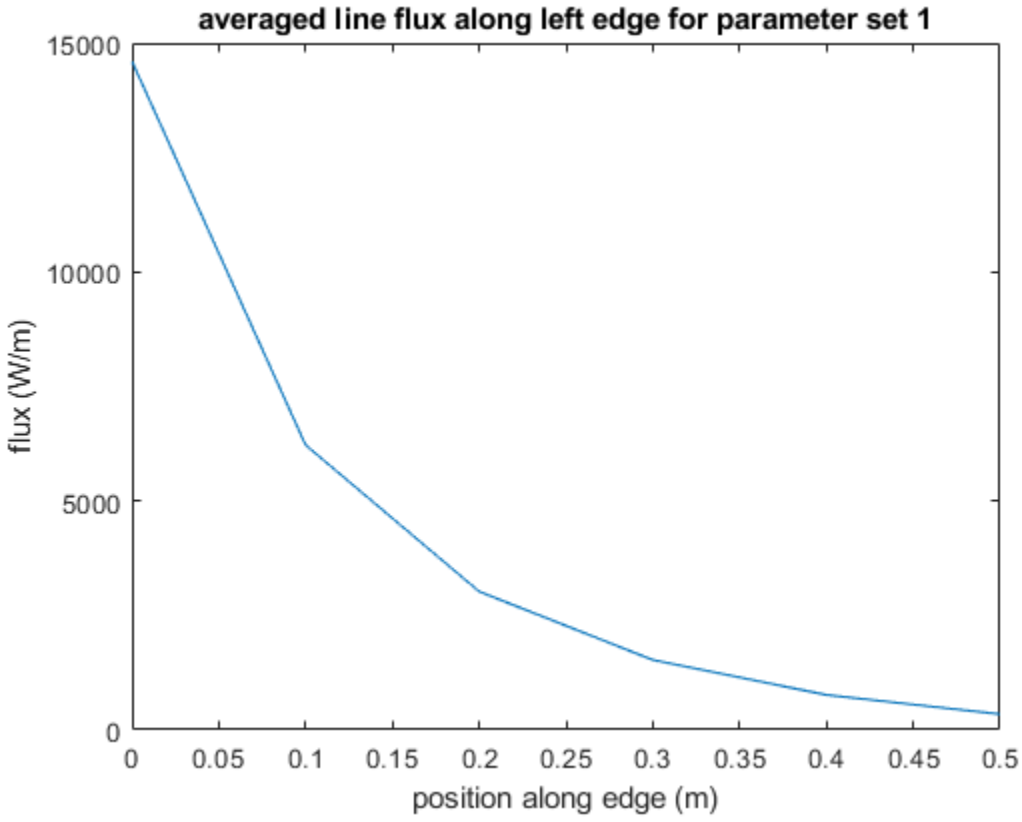
```
        0 0 root(25) root(26) root(27) root(28) 0 0;];

    % for line plots
    edge1=linspace(0,0.5,6);
    edge2=linspace(-.15,.15,4);
    edge3=edge1;

    if count==1
        z1=z;
    end

    if count==2
        z2=z;
    end

    if count==3
        z3=z;
    end

    figure
    contour(x1,y1,z)
    xlabel('x position (m)')
    ylabel('y position (m)')
    title(['Temperature field (deg C) for parameter set
',num2str(count)])
    %flux line plot

    q1=h1*[(root(3)-Tinf1)  root(9)-Tinf1  (root(13)-Tinf1)
(root(17)-Tinf1)  (root(21)-Tinf1)  (root(25)-Tinf1)];
    q2=[h1*(root(25)-Tinf1)  h1*(root(26)-Tinf1) h2*(root(27)-Tinf1)
h2*(root(28)-Tinf1)];
    q3=h2*[(root(6)-Tinf2)  root(12)-Tinf2  (root(16)-Tinf2)
(root(20)-Tinf2)  (root(24)-Tinf2)  (root(28)-Tinf2)];

    figure
    plot(edge1,q1);
    xlabel('position along edge (m)')
    ylabel('flux (W/m)')
    title(['averaged line flux along left edge for parameter set
',num2str(count)])

    figure
    plot(edge2,q2);
    xlabel('position along edge (m)')
    ylabel('flux (W/m)')
    title(['averaged line flux along center for parameter set
',num2str(count)])

    figure
    plot(edge3,q3);
    xlabel('position along edge (m)')
    ylabel('flux (W/m)')
    title(['averaged line flux along right edge for parameter set
',num2str(count)])
```

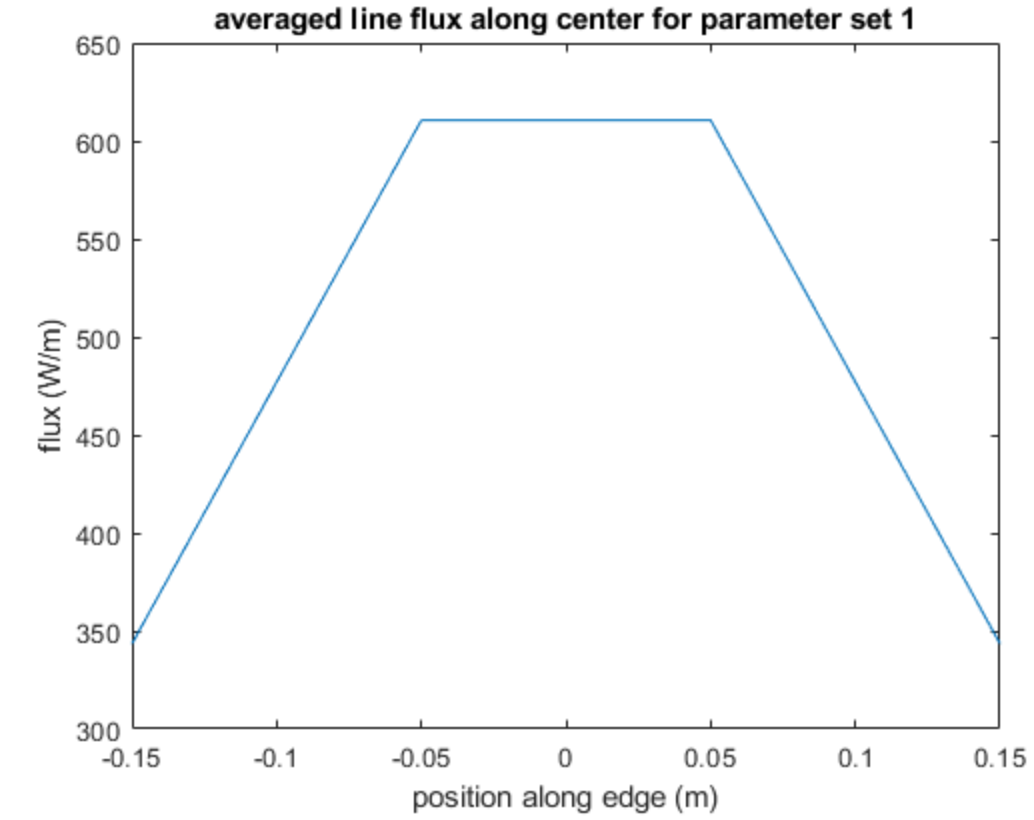
```
    count=count+1;
end
```

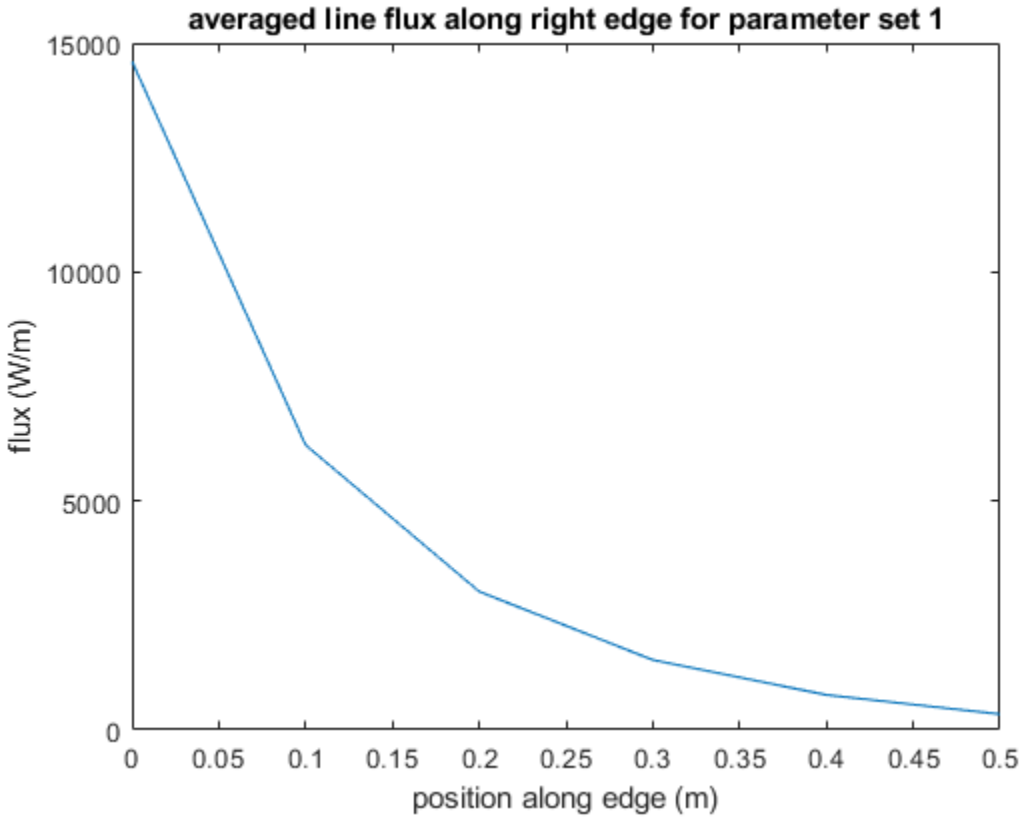
```
Equation solved.

fsolve completed because the vector of function values is near zero
as measured by the value of the function tolerance, and
the problem appears regular as measured by the gradient.


root =

  Columns 1 through 7

  210.6958  242.7831  246.0029  281.5131  281.5131  246.0029  242.7831

  Columns 8 through 14

  210.6958  162.2141  198.5364  198.5364  162.2141  130.2087  151.8820

  Columns 15 through 21

  151.8820  130.2087  115.2741  126.9010  126.9010  115.2741  107.6338

  Columns 22 through 28

  113.5468  113.5468  107.6338  103.4349  106.1057  106.1057  103.4349


Equation solved.

fsolve completed because the vector of function values is near zero
as measured by the value of the function tolerance, and
the problem appears regular as measured by the gradient.


root =

  Columns 1 through 7

  212.0509  241.7289  246.6870  284.9627  284.9627  246.6870  241.7289

  Columns 8 through 14

  212.0509  172.6854  208.2012  208.2012  172.6854  146.8655  166.9554

  Columns 15 through 21

  166.9554  146.8655  135.5293  145.7996  145.7996  135.5293  129.9761

  Columns 22 through 28
```

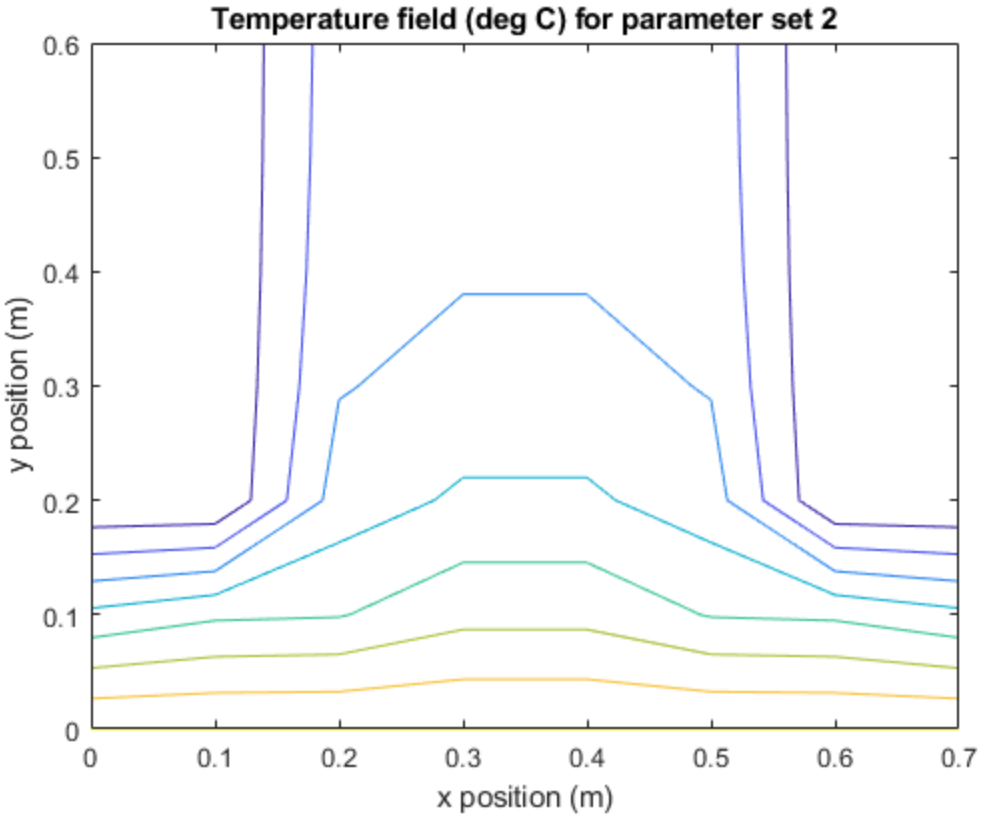
```
  134.9140  134.9140  129.9761  126.9872  128.9664  128.9664  126.9872


Equation solved.

fsolve completed because the vector of function values is near zero
as measured by the value of the function tolerance, and
the problem appears regular as measured by the gradient.


root =

  Columns 1 through 7

  195.0146  227.5657  234.1623  279.1758  285.6908  260.9350  262.3711

  Columns 8 through 14

  232.1060  154.4620  196.8500  202.6525  173.2596  126.1404  151.1097

  Columns 15 through 21

  154.8097  136.6877  113.2313  126.6388  128.7890  118.9035  106.5855

  Columns 22 through 28

  113.4252  114.8038  109.7034  102.7240  105.6726  107.2978  104.8575
```

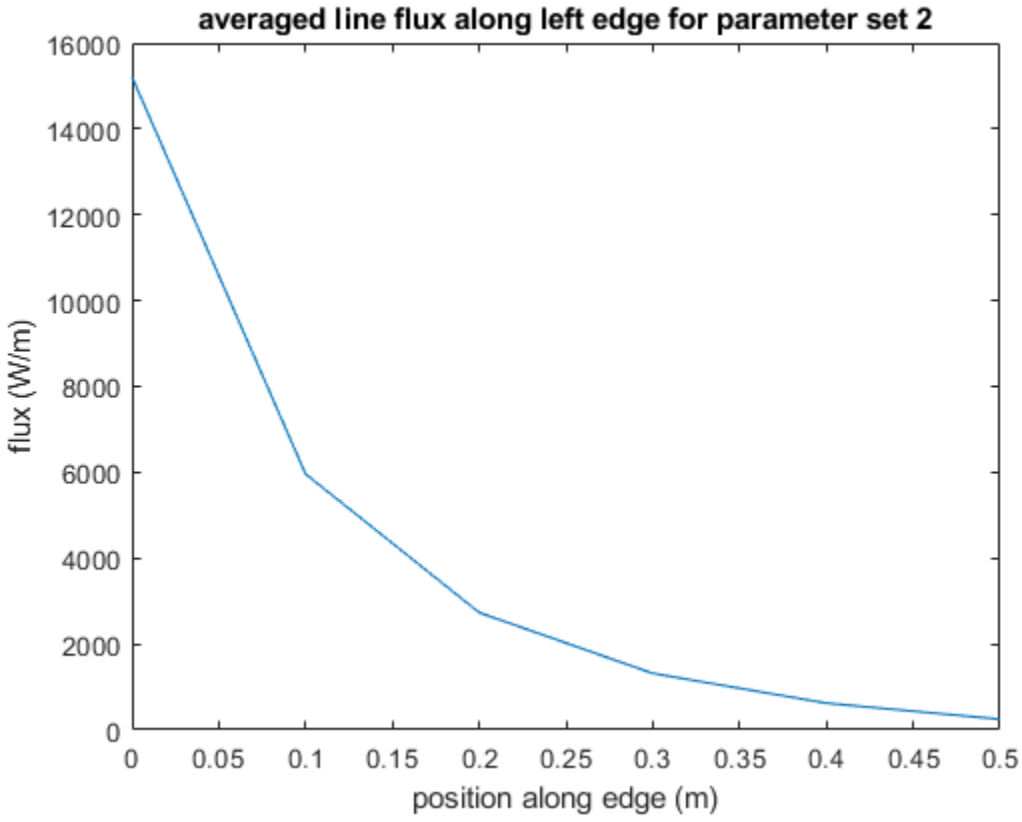

Temperature field (deg C) for parameter set 1
y position (m)
x position (m)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

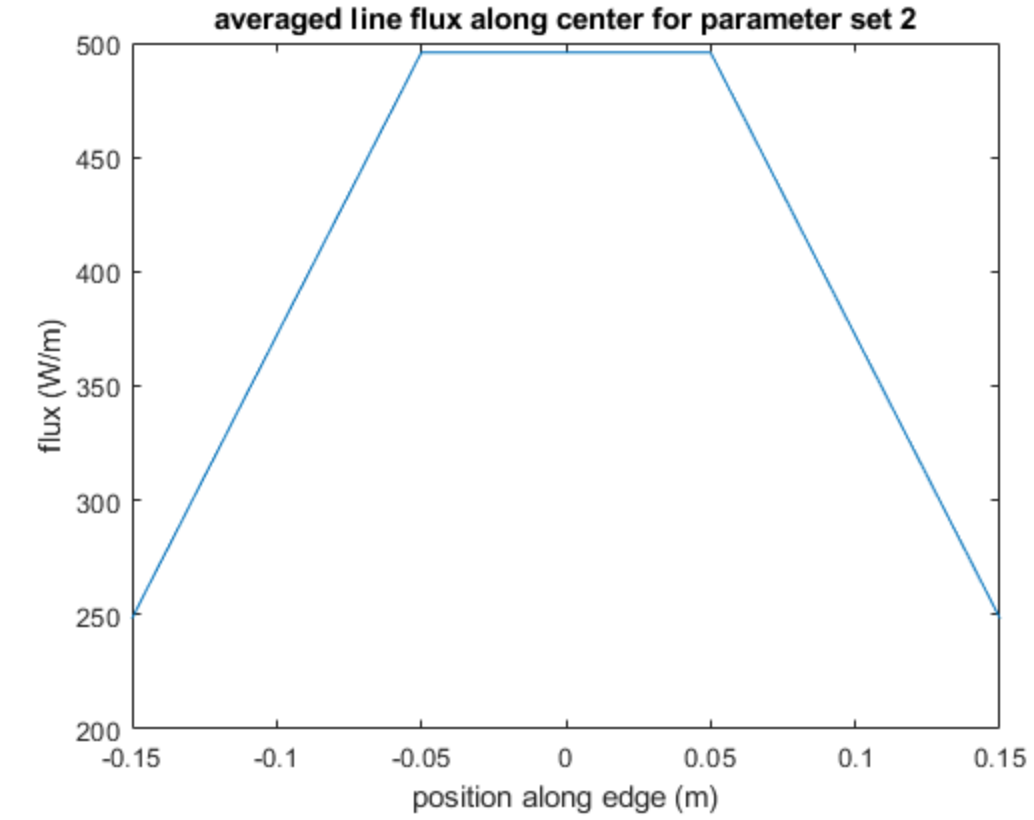

averaged line flux along left edge for parameter set 1
flux (W/m)
position along edge (m)
0
5000
10000
15000
0.05
0.15
0.25
0.35
0.45

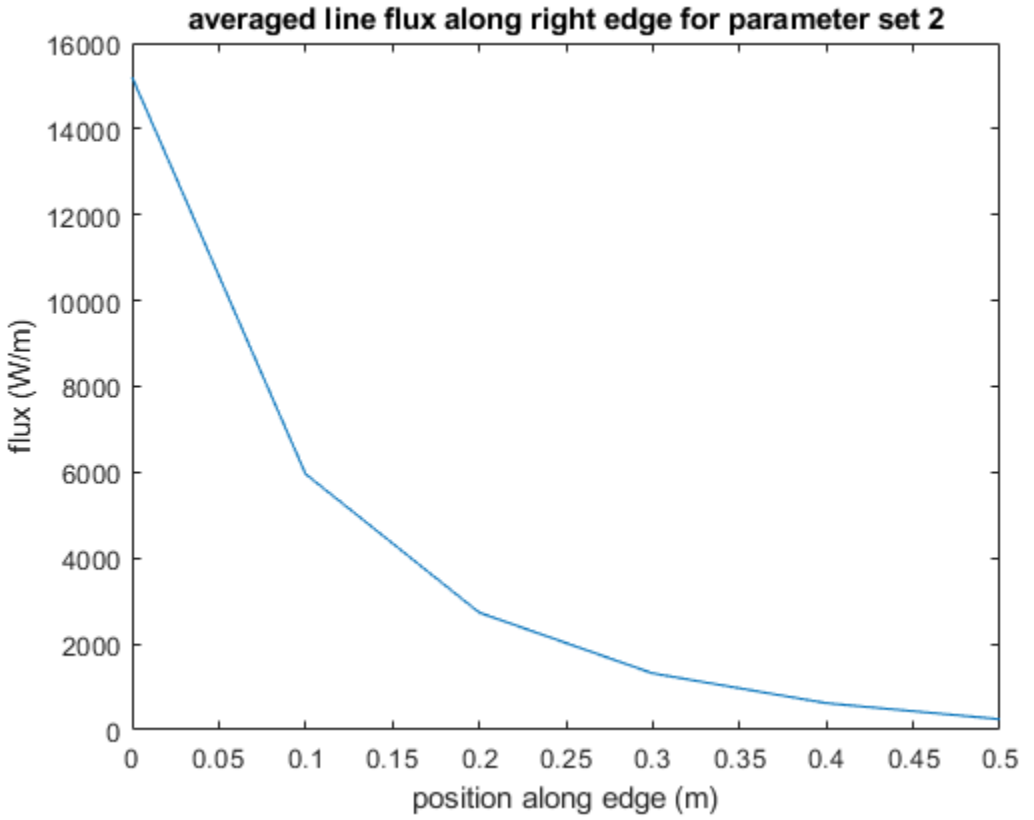

averaged line flux along center for parameter set 1
650
600
550
500
450
400
350
300
flux (W/m)
-0.15
-0.1
-0.05
0
0.05
0.1
0.15
position along edge (m)

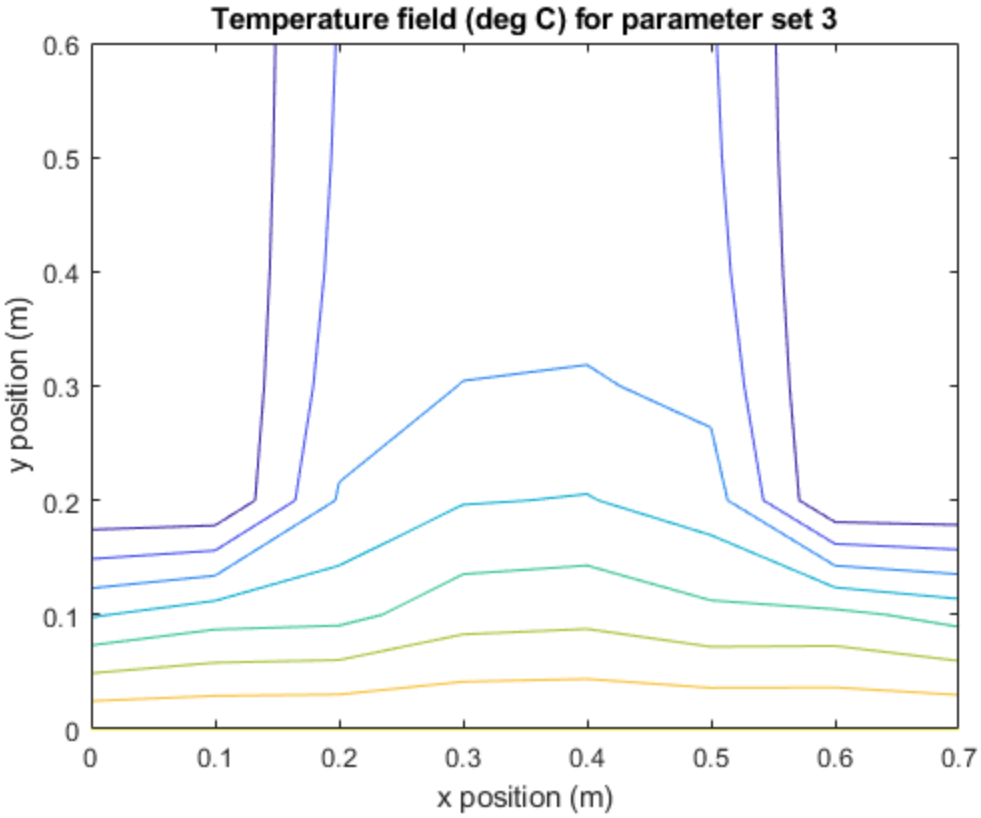

averaged line flux along right edge for parameter set 1
15000
10000
5000
0
flux (W/m)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
position along edge (m)

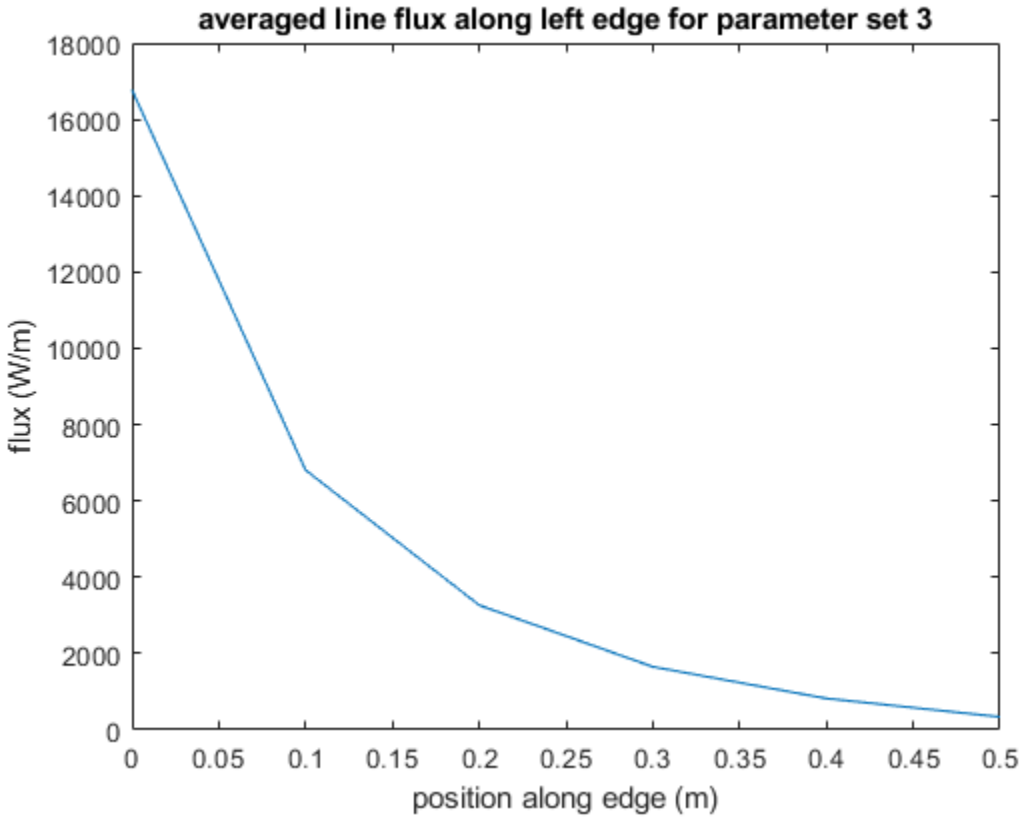

Temperature field (deg C) for parameter set 2
y position (m)
x position (m)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

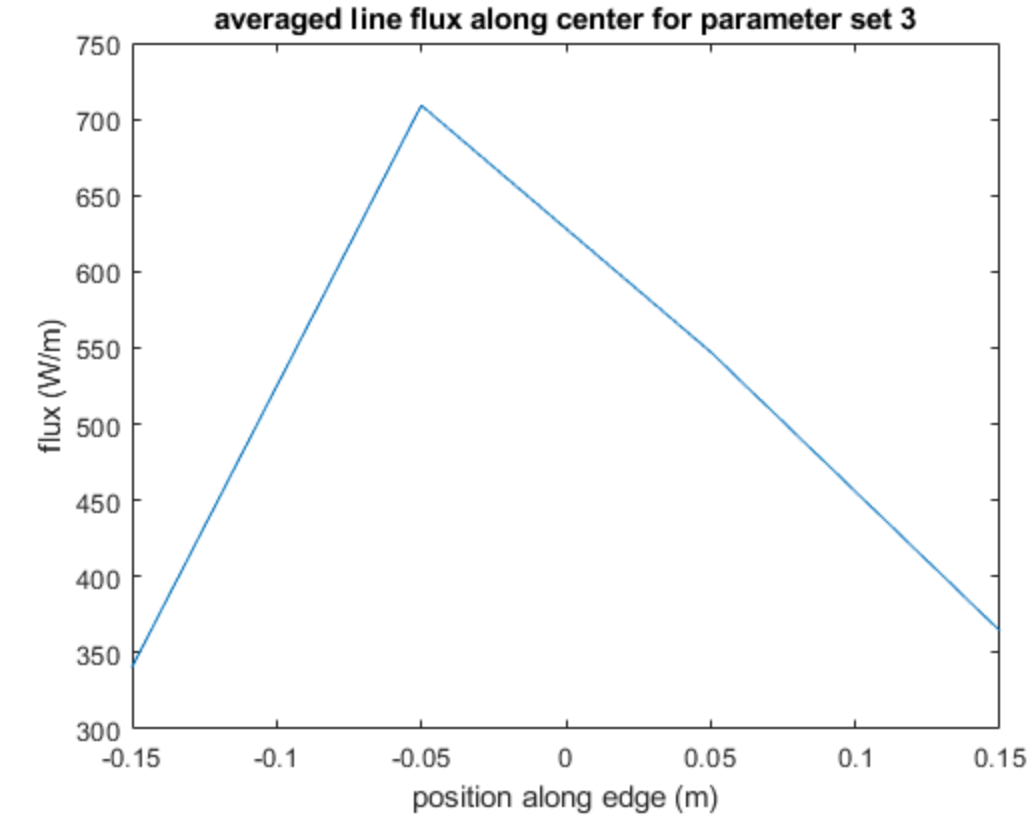

averaged line flux along left edge for parameter set 2
flux (W/m)
position along edge (m)
0
2000
4000
6000
8000
10000
12000
14000
16000
0.05
0.15
0.25
0.35
0.45
0.5

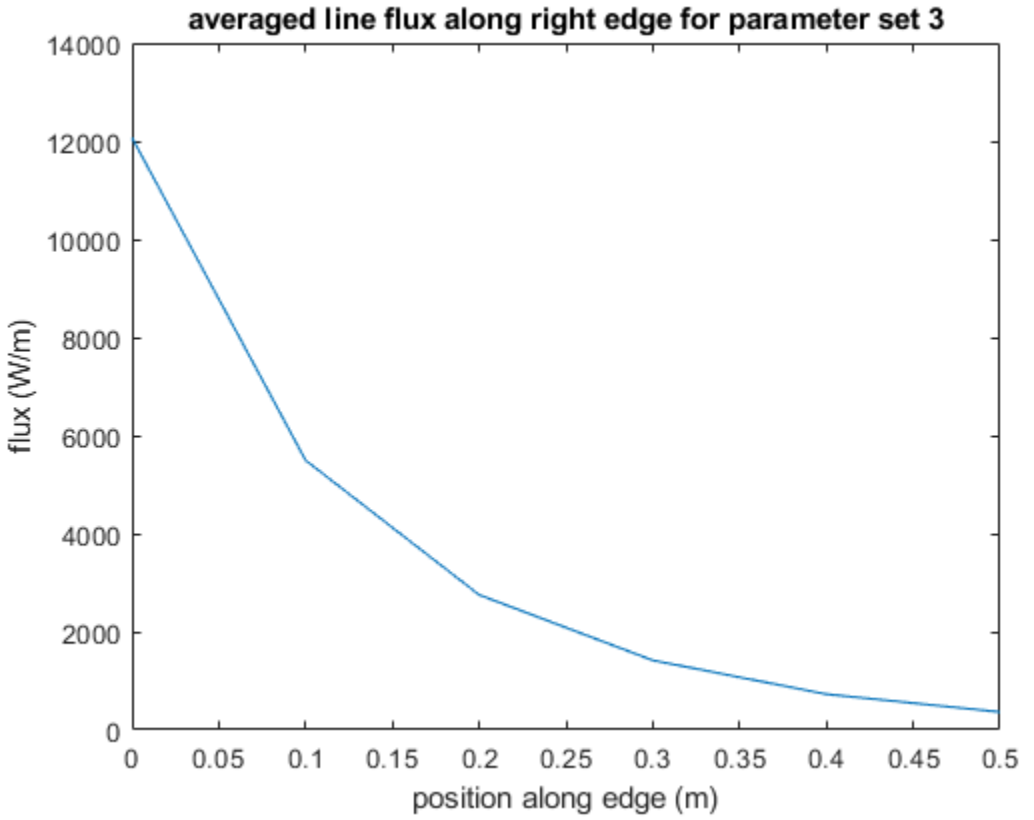

averaged line flux along center for parameter set 2
flux (W/m)
position along edge (m)
500
450
400
350
300
250
200
-0.15
-0.1
-0.05
0
0.05
0.1
0.15


averaged line flux along right edge for parameter set 2
flux (W/m)
position along edge (m)
16000
14000
12000
10000
8000
6000
4000
2000
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


Temperature field (deg C) for parameter set 3
y position (m)
x position (m)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7


averaged line flux along left edge for parameter set 3
flux (W/m)
position along edge (m)
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


averaged line flux along center for parameter set 3
750
700
650
600
550
500
450
400
350
300
flux (W/m)
-0.15
-0.1
-0.05
0
0.05
0.1
0.15
position along edge (m)


averaged line flux along right edge for parameter set 3
14000
12000
10000
8000
6000
4000
2000
0
flux (W/m)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
position along edge (m)

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