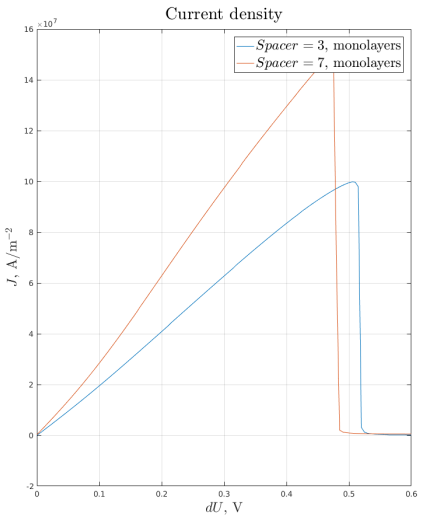
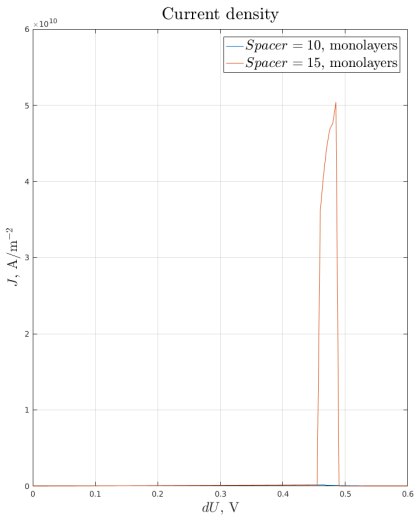
```
clear; clc;

e = 1.6e-19; eVtoJ = e; JtoEv = e^(-1);
me = 9.11*1e-31; nm = 1e-9;

% Do it smooth
dis = 1;
% atoms' radius
dx = 0.56; %nm
dx = dx/dis;

% Count layers
a = [3, 7, 10, 15]; % monolayers
b = 6;
c = 6;

a = a*dis;
b = b*dis;
c = c*dis;

sizeHS = a + b + c + b + a;

% Fermi Energy
EFermi = 1.51*1e-20; % J

% Applyied voltage
dU = 0:0.005:0.6;

% Ec
Ec1 = [zeros(1, a(1)), 0.5*ones(1, b), zeros(1, c), 0.5*ones(1, b),
 zeros(1, a(1))];
Ec2 = [zeros(1, a(2)), 0.5*ones(1, b), zeros(1, c), 0.5*ones(1, b),
 zeros(1, a(2))];
Ec3 = [zeros(1, a(3)), 0.5*ones(1, b), zeros(1, c), 0.5*ones(1, b),
 zeros(1, a(3))];
Ec4 = [zeros(1, a(4)), 0.5*ones(1, b), zeros(1, c), 0.5*ones(1, b),
 zeros(1, a(4))];

% meff
meff1 = [0.067*ones(1, a(1)), 0.15*ones(1, b), 0.067*ones(1, c),
 0.15*ones(1, b), 0.067*ones(1, a(1))];
meff2 = [0.067*ones(1, a(2)), 0.15*ones(1, b), 0.067*ones(1, c),
 0.15*ones(1, b), 0.067*ones(1, a(2))];
meff3 = [0.067*ones(1, a(3)), 0.15*ones(1, b), 0.067*ones(1, c),
 0.15*ones(1, b), 0.067*ones(1, a(3))];
meff4 = [0.067*ones(1, a(4)), 0.15*ones(1, b), 0.067*ones(1, c),
 0.15*ones(1, b), 0.067*ones(1, a(4))];

reserve = 20;

% numPoint = 5000;
```

```
% Tr1 = getTransperent(...
%  dx*nm, ...
%  meff1*me, ...
%  Ec1*eVtoJ,...
%  numPoint...
% );
tic
J1 = getJ(dx*nm, ...
 meff1*me, ...
 Ec1*eVtoJ, ...
 dU*eVtoJ, ...
 EFermi, ...
 reserve, ...
 a(1),...
 b,...
 c...
);
% % Tr2 = getTransperent(...
% %  dx*nm, ...
% %  meff2*me, ...
% %  Ec2*eVtoJ,...
% %  numPoint...
% % );

J2 = getJ(dx*nm, ...
 meff2*me, ...
 Ec2*eVtoJ, ...
 dU*eVtoJ, ...
 EFermi, ...
 reserve, ...
 a(2),...
 b,...
 c...
);

% Tr3 = getTransperent(...
%  dx*nm, ...
%  meff3*me, ...
%  Ec3*eVtoJ,...
%  numPoint...
% );

J3 = getJ(dx*nm, ...
 meff3*me, ...
 Ec3*eVtoJ, ...
 dU*eVtoJ, ...
 EFermi, ...
 reserve, ...
 a(3),...
 b,...
 c...
);

% Tr4 = getTransperent(...
```

```
%  dx*nm, ...
%  meff4*me, ...
%  Ec4*eVtoJ,...
%  numPoint...
% );
%
J4 = getJ(dx*nm, ...
 meff4*me, ...
 Ec4*eVtoJ, ...
 dU*eVtoJ, ...
 EFermi, ...
 reserve, ...
 a(4),...
 b,...
 c...
);
toc

% showResult(dx*nm, sizeHS, Ec1, Ec2, Ec3, Ec4, J1, J2, J3, J4, dU,
 Tr1, Tr2, Tr3, Tr4, a);
showResult(dx*nm, sizeHS, Ec1, Ec2, Ec3, Ec4, J1, J2, J3, J4, dU,
 a); % img 3.8 img 3.9
```

*Elapsed time is 3125.481989 seconds.*

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