MATLAB Program for Absorptance and Emittance Calculation

B.1 ABSORPTANCE CALCULATION

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        % Caution: before running the program, kindly load data file having first
% column as Lambda (λ) values, second as 1-R (Lambda) and third as a reference
%****************Input Data reading****************************%
Lambda=data(:,1);
R=data(:,2);  % R represents (1-R(Lambda))
I=data(:,3);
n=size(Lambda);
Numerator=zeros(1,n(1));
for i=1:n(1)
   Numerator(i)=R(i)*I(i);        % generates complete numerator column
   end
A=trapz(Lamda, Numerator) % Numerical integration of numerator of absorptance expression
B=trapz(Lamda, I)      % Numerical integration of denominator of absorptance expression
absorbance=A/B           % final absorptance value
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B.2 EMITTANCE CALCULATION

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        % Caution: before running the program, kindly load data file having first
% column as Lambda values and second as R (Lambda)
%****************Input Data reading****************************%
L=data(:,1);
Lambda=L*1e-6;
R=data(:,2);
n=size(Lambda);
T=300;
c1=3.743e-16;
c2=0.0143879;
Eb=zeros(1,n(1));
Numerator=zeros(1,n(1));
for i=1:n(1)
   Eb(i)=c1/((Lambda(i))^5*(exp(c2/(Lambda(i)*T))-1)); % generates Eb data column
   Numerator(i)=(1-R(i))*Eb(i);                % generates complete numerator column
   end
A=trapz(Lambda, Numerator) % Numerical integration of numerator of emittance expression
B=trapz(Lambda, Eb)      % Numerical integration of denominator of emittance expression
epsilon=A/B           % final emittance value
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