alpha_micro

Computes coefficients of thermal expansions in local directions

Inputs

Ef - Fiber elastic modulus
Em - Matrix elastic modulus
nuf - Fiber Poisson's ratio
numm - Matrix Poisson's ratio
Vf - Fiber volume fraction
alphaf - Fiber coefficient of thermal expansion
alpham - Matrix coefficient of thermal expansion

Outputs

alpha12 - [alpha1 alpha2 alpha12]
alpha1 - Local coefficient of thermal expansion in x-direction
alpha2 - Local coefficient of thermal expansion in y-direction
alpha12 - Local in-plane coefficient of thermal expansion in x-y plane

Calling the Function

```
[alpha12]=alpha_micro(Ef,Em,nuf,numm,alphaf,alpham,Vf)
```

Testing File

Click here to see a testing file for using the function alpha_micro

Example

Inputs:

```
Fiber Elastic Modulus: 8.5e+10
Matrix Elastic Modulus: 3.4e+09
Fiber Poisson`s Ratio: 0.2
Matrix Poisson`s Ratio: 0.3
Fiber Coefficient of Thermal Expansion: 5e-06
Matrix Coefficient of Thermal Expansion: 6.3e-05
Fiber Volume Fraction: 0.6
```

Outputs:

Lamina Coefficient of Thermal Expansion

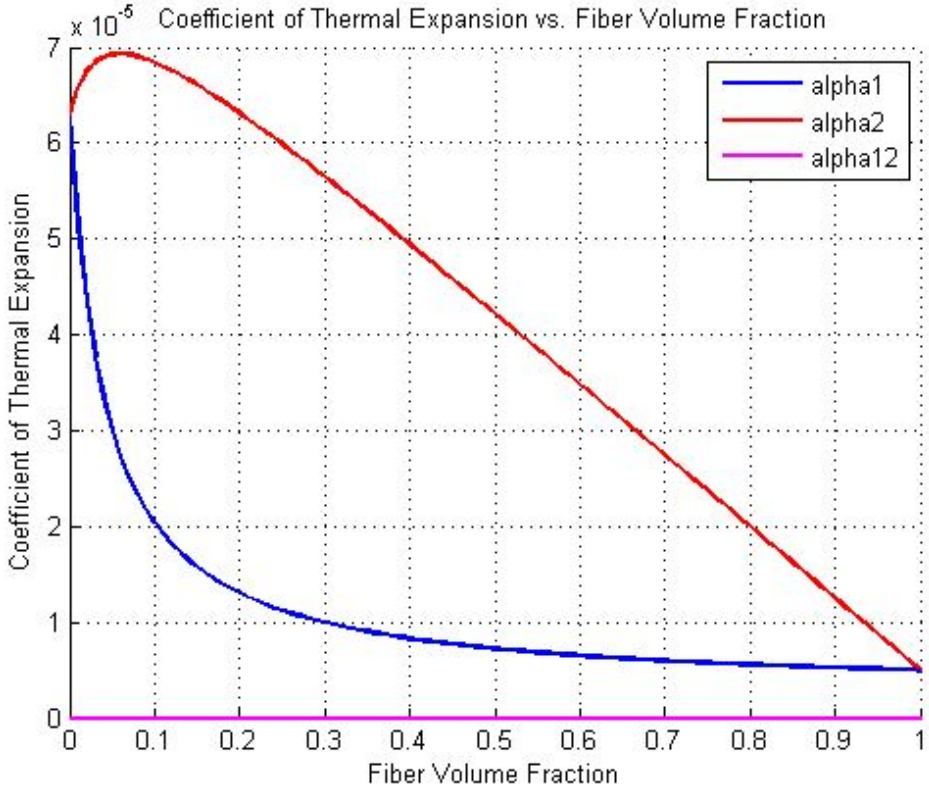
alpha1	6.50649E-06
alpha2	3.47984E-05
alpha12	0

Table:

Lamina Coefficient of Thermal Expansion

Vf	alpha1	alpha2	alpha12
0.00	6.300000E-05	6.300000E-05	0
0.10	2.035294E-05	6.840765E-05	0
0.20	1.300000E-05	6.308000E-05	0
0.30	9.951220E-06	5.644317E-05	0
0.40	8.283019E-06	4.938642E-05	0
0.50	7.230769E-06	4.214231E-05	0
0.60	6.506494E-06	3.479844E-05	0
0.70	5.977528E-06	2.739517E-05	0
0.80	5.574257E-06	1.995366E-05	0
0.90	5.256637E-06	1.248611E-05	0
1.00	5.000000E-06	5.000000E-06	0

Graph:



Description

Outputs local coefficients of thermal expansion in matrix form:
[alpha1,alpha2,alpha12]