
ABD

Computes extensional, coupling, bending, normalized extensional, normalized coupling, and normalized bending stiffness matrices

Inputs

nplies - Number of plies
Qplies - Reduced stiffness matrix for each ply
angleplies - Angle of each ply in degrees
tplies - Thickness of each ply

Outputs

[A] - Extensional stiffness matrix
[B] - Coupling stiffness matrix
[D] - Bending stiffness matrix
[An] - Normalized extensional stiffness matrix
[Bn] - Normalized Coupling stiffness matrix
[Dn] - Normalized Bending stiffness matrix

Calling the Function

`[A,B,D,An,Bn,Dn]=ABD(nplies,Qplies,angleplies,tplies)`

Testing File

Click [here](#) to see a testing file for using the function ABD

Example

Inputs:

Number of plies: 3

Reduced Stiffness Matrix:

1.0e+11 *		
1.8180	0.0290	0
0.0290	0.1035	0
0	0	0.0717

For Ply: 1

Ply Angle: 0

Ply Thickness: 0.005

For Ply: 2

Ply Angle: 30

Ply Thickness: 0.005

For Ply: 3
Ply Angle: -45
Ply Thickness: 0.005

Outputs:

Extensional Stiffness Matrix:

1.0e+09 *			
1.7391	0.3884	0.0566	
0.3884	0.4533	-0.1141	
0.0566	-0.1141	0.4525	

Coupling Stiffness Matrix:

1.0e+06 *			
-3.1286	0.9855	-1.0716	
0.9855	1.1576	-1.0716	
-1.0716	-1.0716	0.9855	

Bending Stiffness Matrix:

1.0e+04 *			
3.3430	0.6461	-0.5240	
0.6461	0.9320	-0.5595	
-0.5240	-0.5595	0.7663	

Normalized Extensional Stiffness Matrix:

1.0e+11 *			
1.1594	0.2589	0.0378	
0.2589	0.3022	-0.0760	
0.0378	-0.0760	0.3016	

Normalized Coupling Stiffness Matrix:

1.0e+10 *			
-2.7810	0.8760	-0.9525	
0.8760	1.0290	-0.9525	
-0.9525	-0.9525	0.8760	

Normalized Bending Stiffness Matrix:

1.0e+11 *			
1.1886	0.2297	-0.1863	
0.2297	0.3314	-0.1989	
-0.1863	-0.1989	0.2724	

Description

Outputs the extensional, coupling, and bending stiffness matrices as well as their normalized counterparts