Dear all,

We use ABAQUS-swiftcomp to model isotropic and homogeneous rectangular plates. The geometric parameters of SG include side length L = 40mm, thickness t = 0.5mm, and material properties are E= 206GPa, v = 0.3. The obtained tensile stiffness is the same as the analytical solution, but the difference between the obtained bending stiffness and the analytical solution is large (see attachment). Could you please tell the the reason? THX

Calculation results of Swiftcomp:

The Effective Stiffness Matrix

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 1.1318681E+05  3.3956044E+04  1.1478261E-26  2.8296703E+04  8.4890110E+03  7.6928200E-28
 3.3956044E+04  1.1318681E+05  1.4084032E-26  8.4890110E+03  2.8296703E+04  7.5230288E-28
 1.1478261E-26  1.4084032E-26  3.9615385E+04  3.4296113E-27  3.6712385E-27  9.9038462E+03
 2.8296703E+04  8.4890110E+03  3.4296113E-27  9.9627976E+03  3.3602335E+03  2.0607332E-28
 8.4890110E+03  2.8296703E+04  3.6712385E-27  3.3602335E+03  9.9627976E+03  2.9578970E-28
 7.6928200E-28  7.5230288E-28  9.9038462E+03  2.0607332E-28  2.9578970E-28  3.3012821E+03
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$\bar{D}_{11}=\bar{D}_{22}$	$\bar{D}_{12}$	$\bar{D}_{33}$
9. 96E+00	3. 36E+00	3. 30E+00

Analytical solution:

$$\boldsymbol{A}=\begin{bmatrix} A_{11} & A_{12} & 0 \\ A_{21} & A_{22} & 0 \\ 0 & 0 & A_{33} \end{bmatrix}=\begin{bmatrix} \frac{Et}{1-v^2} & \frac{Etv}{2(1-v^2)} & 0 \\ \frac{Etv}{2(1-v^2)} & \frac{Et}{1-v^2} & 0 \\ 0 & 0 & \frac{Et}{2(1+v)} \end{bmatrix},\quad \boldsymbol{D}=\begin{bmatrix} D_{11} & D_{12} & 0 \\ D_{21} & D_{22} & 0 \\ 0 & 0 & D_{33} \end{bmatrix}=\begin{bmatrix} \frac{Et^3}{12(1-v^2)} & \frac{Et^3v}{12(1-v^2)} & 0 \\ \frac{Et^3v}{12(1-v^2)} & \frac{Et^3}{12(1-v^2)} & 0 \\ 0 & 0 & \frac{Et^3}{24(1+v)} \end{bmatrix}$$

$\bar{D}_{11}=\bar{D}_{22}$	$\bar{D}_{12}$	$\bar{D}_{33}$
2. 36E+00	7. 07E-01	8. 25E-01