Constructing double corrugated surfaces in CAD software

by Kristina Navickaitė

Step 1. Define the global variables in *Equation tool*.

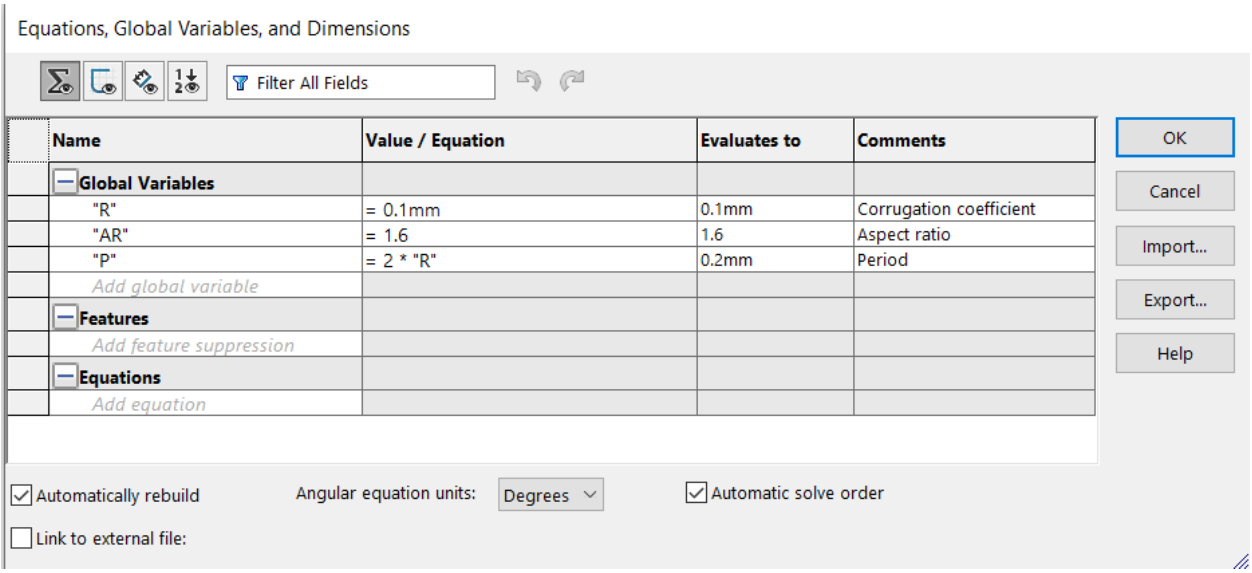

Figure 1. Definition of parametric equations.

Step 2. Create *Plane 1* parallel to a selected original plane. Define the distance *x* between two planes.
Step 3. Create a sketch using the parametric equation as shown in Figure 2. Note that the double corrugated plate geometry is defined as given in Eq. (1). However, for constructing the geometry in CAD software, each term of Eq. (1) must be used separately.

$$z = R \cdot AR^{\left(\sin\left(\frac{2\pi}{P}x\right)\right)} + R \cdot AR^{\left(-\sin\left(\frac{2\pi}{P}y\right)\right)} \quad (1)$$

where *P* is the corrugation period, *AR* is the aspect ratio of the *x* and *y* axes, and *z* is the plate thickness. *R* is the radius of the equivalent straight tube. However, here *R* serves as a coefficient of the corrugation amplitude. The sketch contains two parametric curves created using the first term of Eq. (1). These curves are displaced by the distance *z*, which is the plate thickness. Two identical sketches must be created for both parallel planes defined in Step 2 as shown in Figure 3.

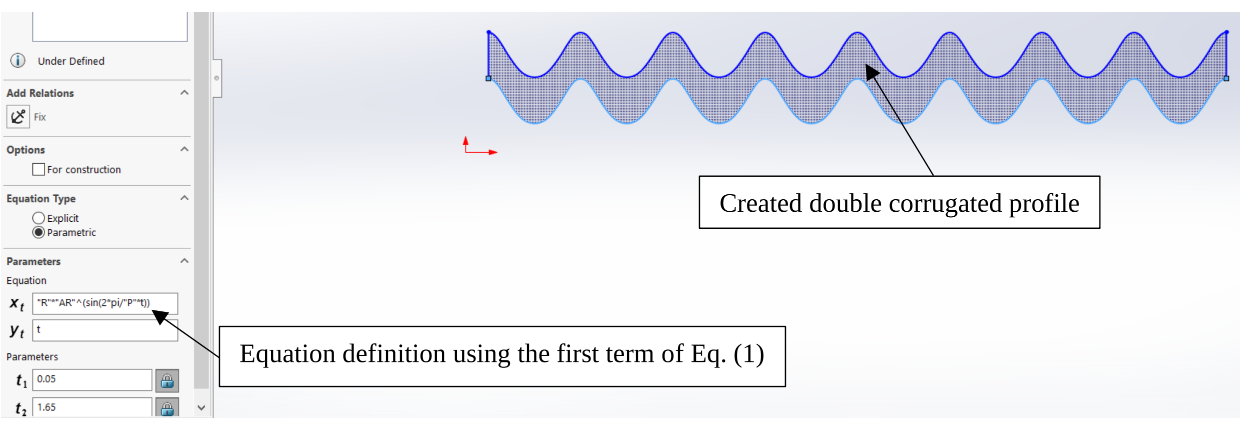

Figure 2. Definition of the start of the geometry.

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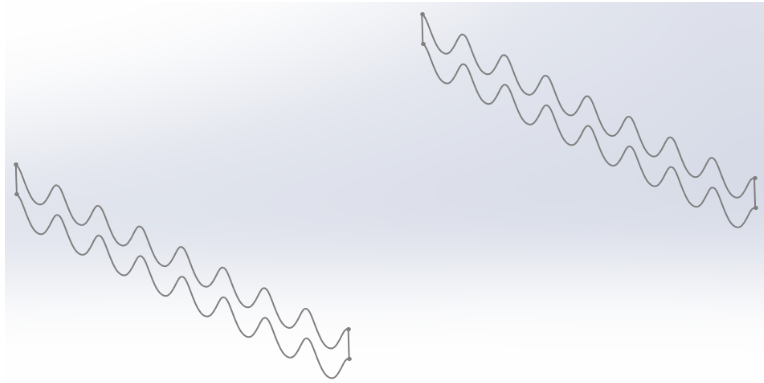

Figure 3. Two parallel sketches defining the start and end of a double corrugated plate.

Step 4. Create *Plane 2* parallel to a selected second original plane that is orthogonal to the planes defined in Step 2. Define the distance *y* between the two planes.
Step 5. Create a sketch using the second term of Eq. (1) as shown in Figure 4 Two identical sketches must be created for both parallel planes defined in Step 4 as shown in Figure 4. These curves will serve as guide curves for constructing the solid body.

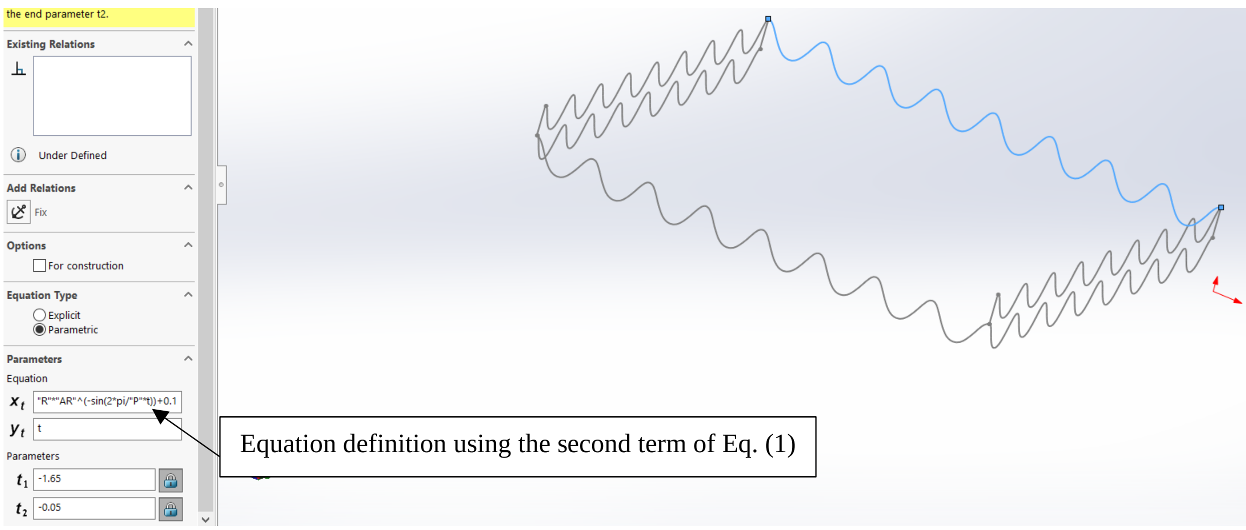

Figure 4. Definition of the guide curves for constructing the solid body.

Step 6. Use *Lot* function to create the surface as shown in Figure 5.

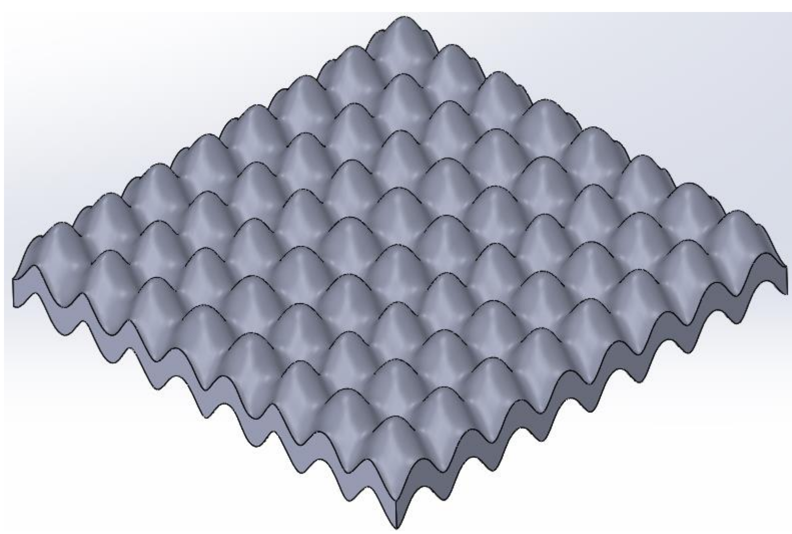

Figure 5. Lofted surface in CAD software.

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