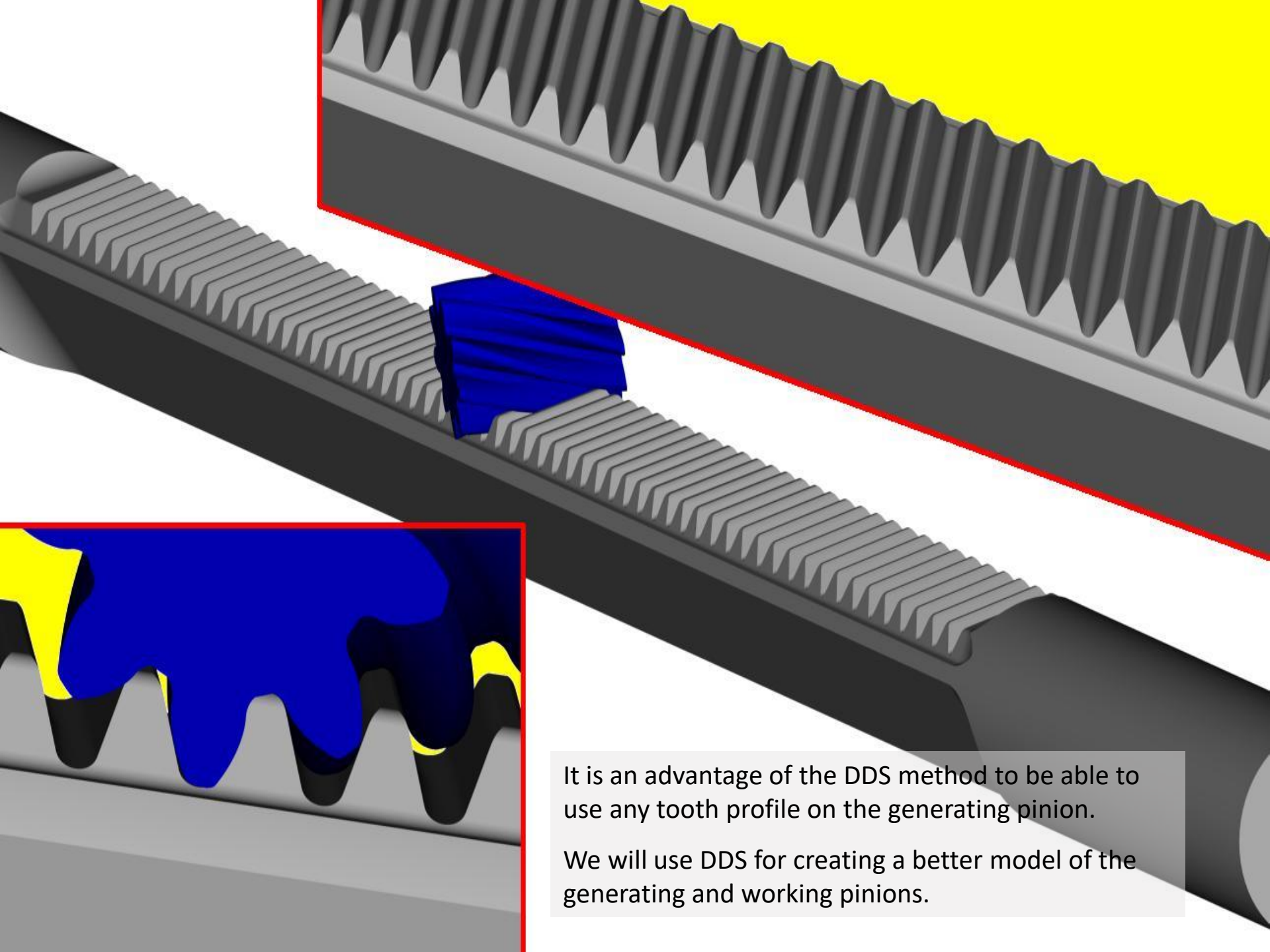
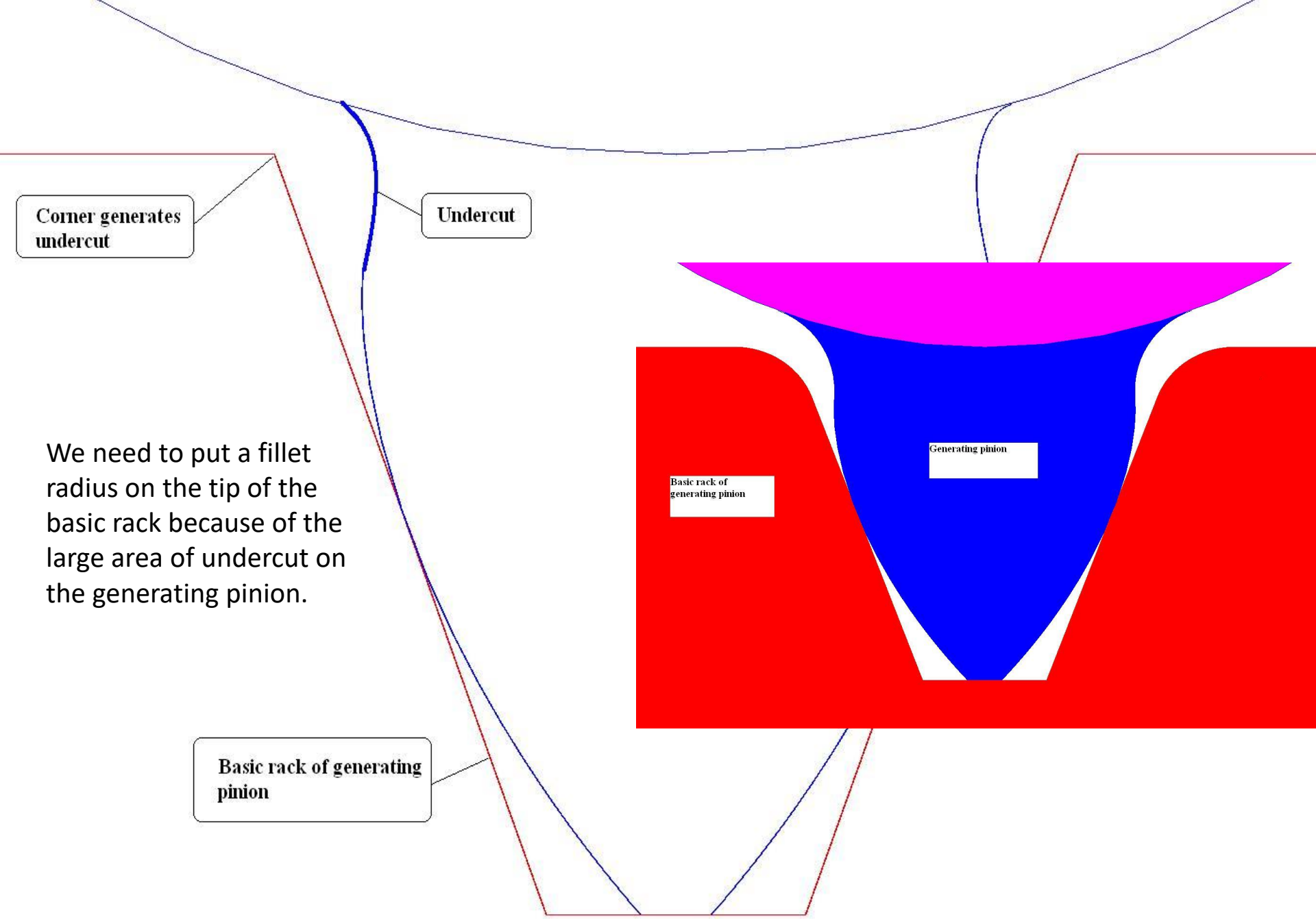


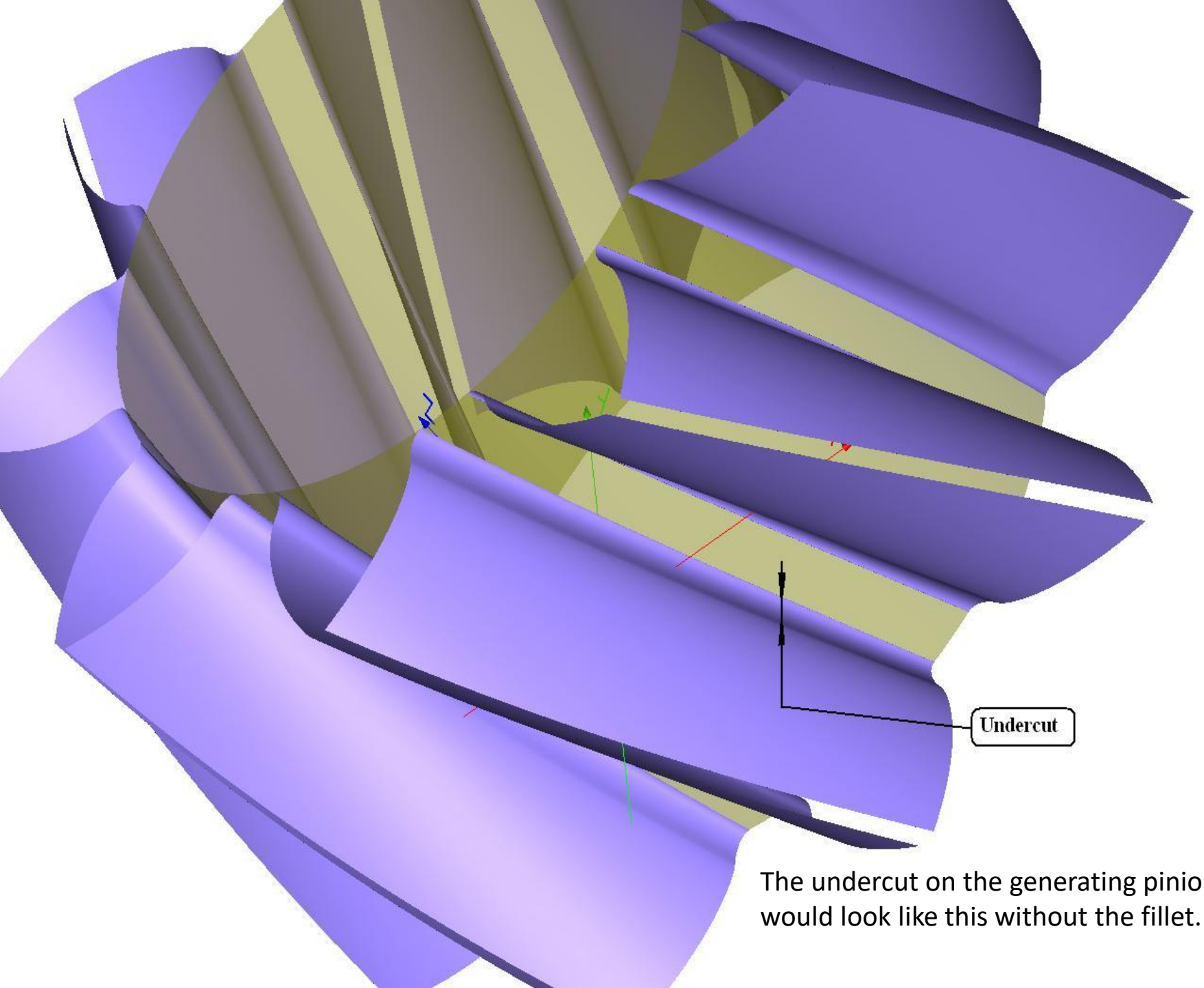
It is an advantage of the DDS method to be able to use any tooth profile on the generating pinion.

We will use DDS for creating a better model of the generating and working pinions.

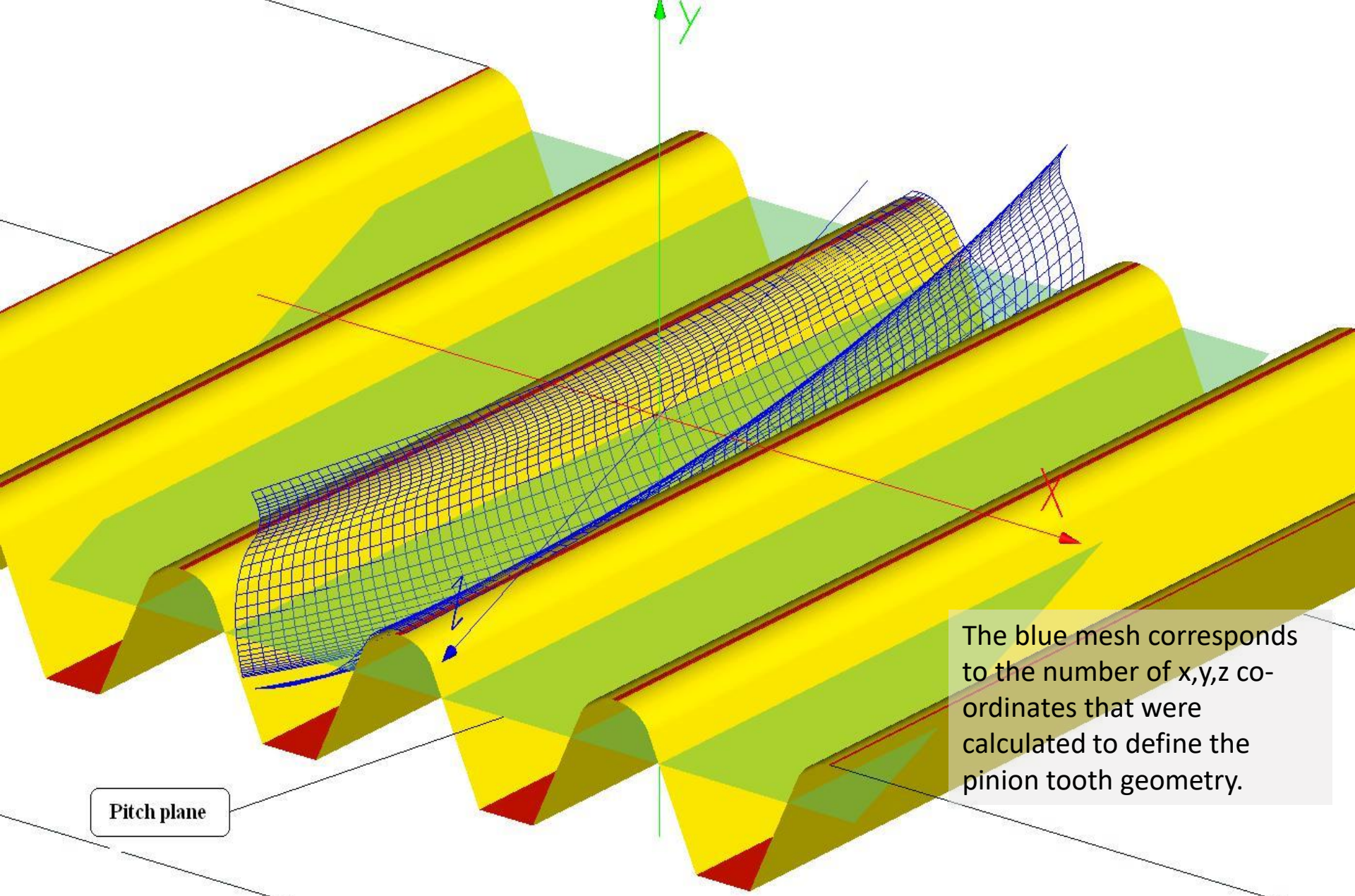


We need to put a fillet radius on the tip of the basic rack because of the large area of undercut on the generating pinion.

Creating 3-dimensional geometry of the generating pinion. This pinion will generate the vr-rack.



The undercut on the generating pinion would look like this without the fillet.



The blue mesh corresponds to the number of x,y,z co-ordinates that were calculated to define the pinion tooth geometry.

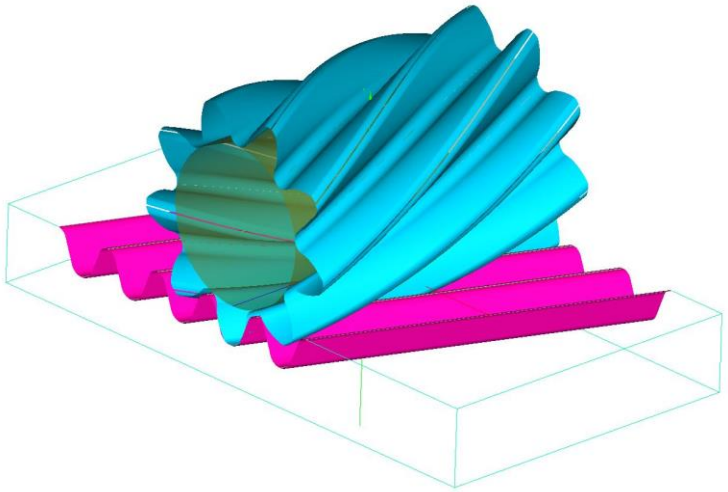
Geometry simulation of the generating pinion tooth. The generating pinion will be used as the cutting tool to generate the variable ratio rack.

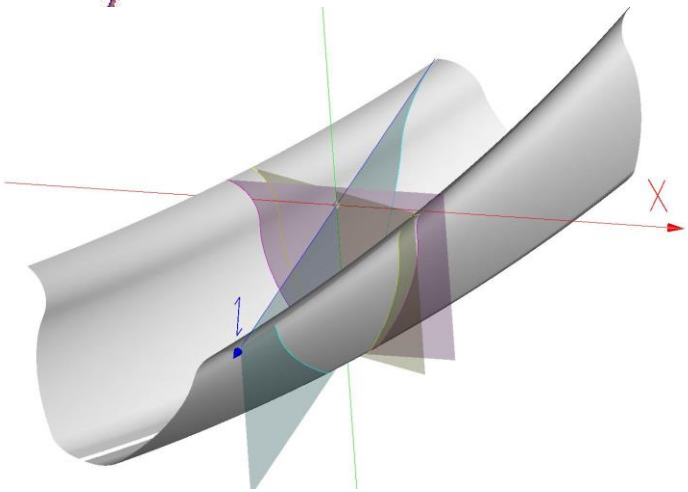
The basic rack of the working pinion is different from the basic rack of the generating pinion to provide clearance and backlash.

Working pinion has round root to reduce the effect of undercut.

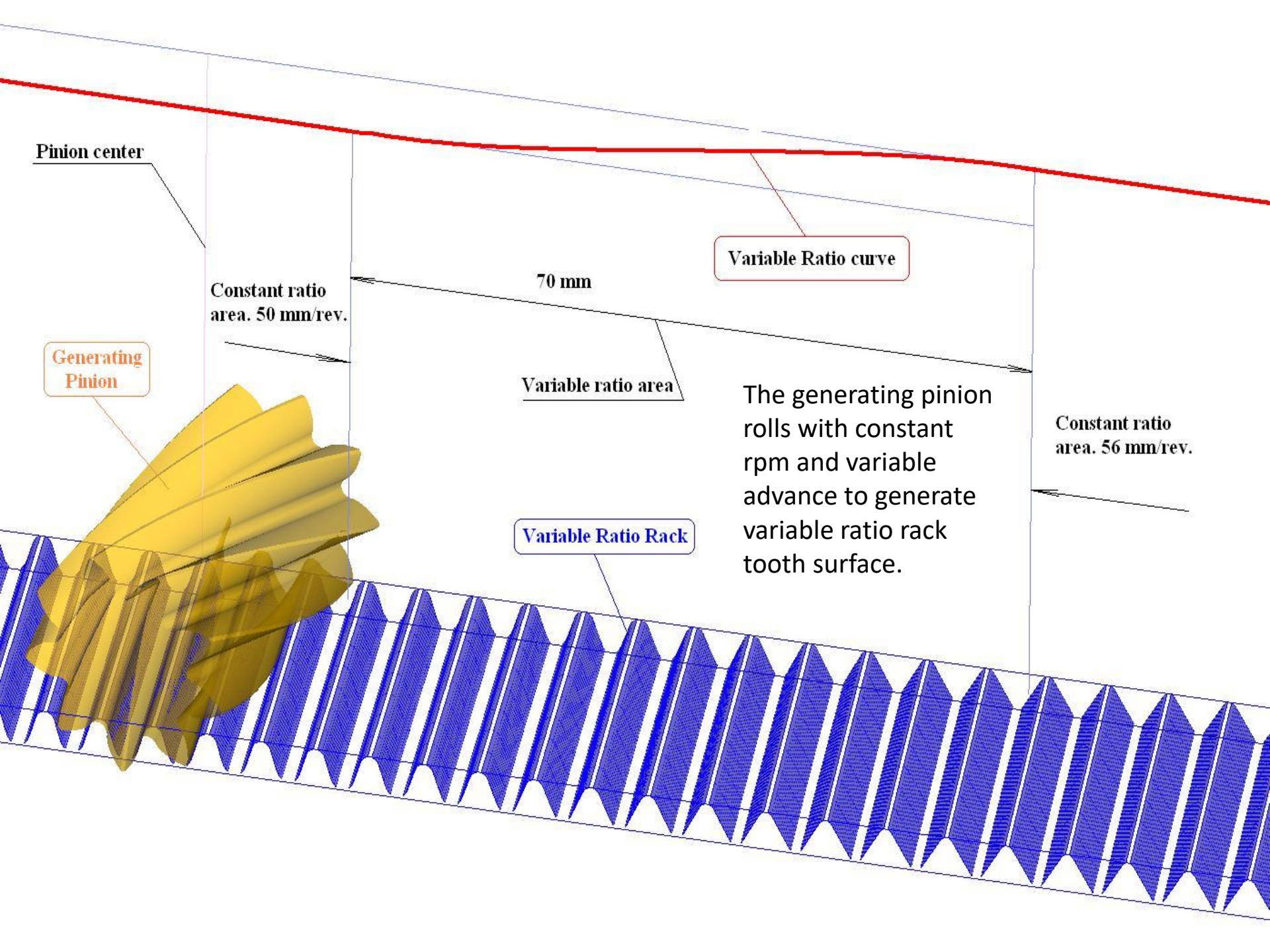
The tip of the pinion is generated by the fillet on the root of the basic rack.

As you may see the round fillet on the root of the rack does not generate the same round fillet on the tip of the pinion. The pinion has a corner in transition from involute to the round tip.

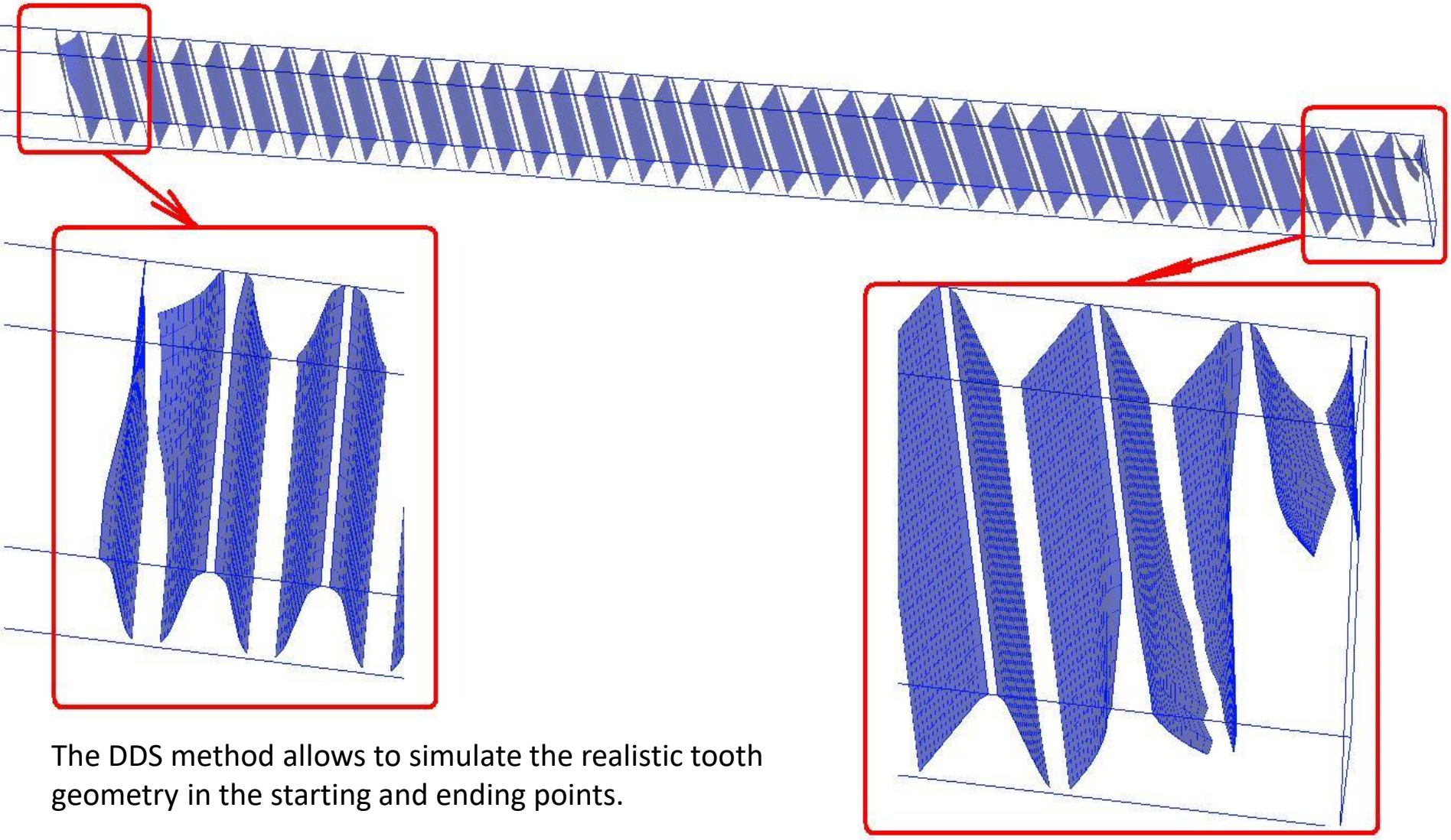




Normal, axial and transversal sections on the working pinion.

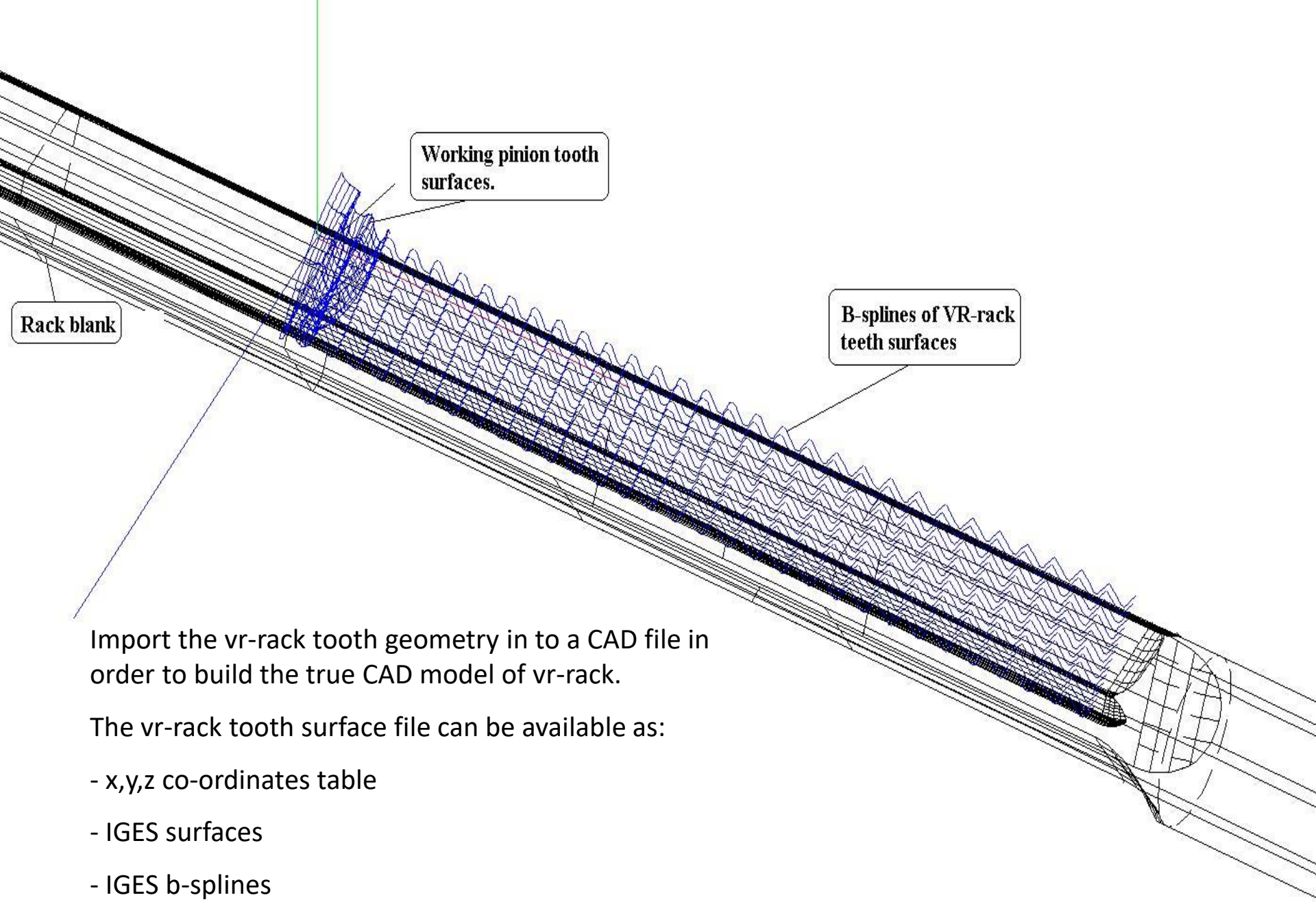


The generating pinion rolls with constant rpm and variable advance to generate variable ratio rack tooth surface.



The DDS method allows to simulate the realistic tooth geometry in the starting and ending points.

By using the true geometry of the teeth at the end of the vr-rack it is possible to reduce the overall length of the rack.



Import the vr-rack tooth geometry in to a CAD file in order to build the true CAD model of vr-rack.

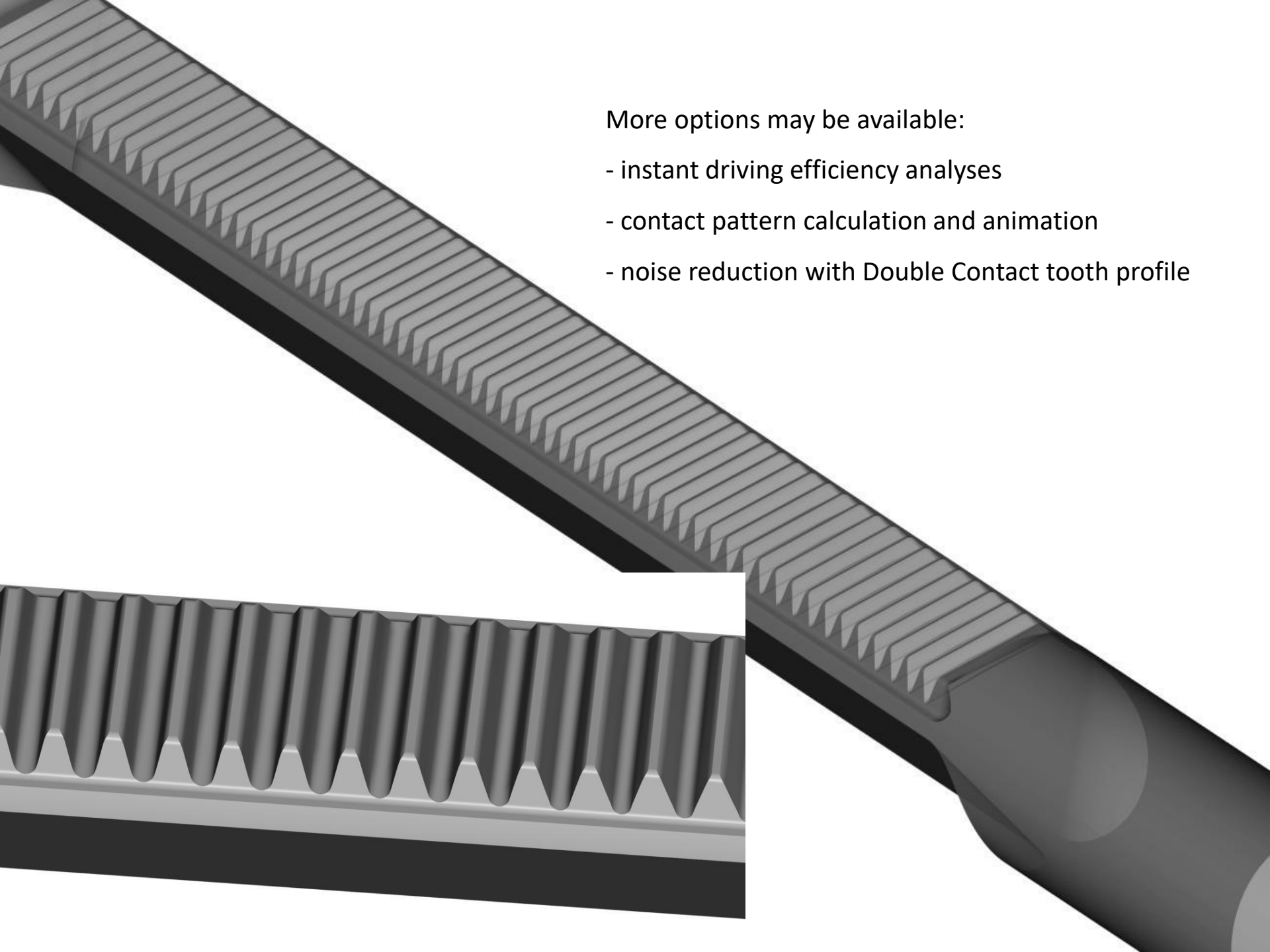
The vr-rack tooth surface file can be available as:

- x,y,z co-ordinates table

- IGES surfaces

- IGES b-splines

- complete tooth face or each tooth individually.



More options may be available:

- instant driving efficiency analyses
- contact pattern calculation and animation
- noise reduction with Double Contact tooth profile