

Defining the Spacecraft Attitude

Use *Spacecraft Attitude* to setup the orientation of the spacecraft, to define spacecraft rotation about an axis and to specify spacecraft spin.

Initial Orientation

To orient the spacecraft, you select from the graphic region two edges of your model: *Vector 1* and *Vector 2*. These two vectors cannot be parallel.

Once you have select the vectors, assign them an orientation. The vectors cannot have parallel orientation. For non-rotating spacecraft, *Vector 1* always aims at its specified orientation. For rotating spacecraft *Vector 1* aims at it specified orientation at time 0. *Vector 2* is aligned with its specified orientation.

In the event that the two vectors are not perpendicular or that their respective orientations are not perpendicular, *Vector 2* will be kept as close as possible to its specified orientation. During the course of the orbiting, the orientation of the spacecraft is calculated and adjusted at each calculation position. Therefore, the orientation of the spacecraft is uniquely defined as desired at each position.

The orientation option for both vectors are:

- Nadir
- Sun
- Star
- Velocity Vector
- Orbit Normal
- North
- South

If you specify *Star*, you have to define the right ascension and the declination of the star.

Rotating Spacecraft

Rotating spacecraft, by opposition to spinning spacecraft, have small rotation rate, no more than a few revolutions per orbit. Calculation of view factors takes into account this slow rotation of the spacecraft. To define a rotating spacecraft, you have to select the axis of rotation and to define the rate of rotation.

To select an axis of rotation, first select a point that lies on the axis. The point does not have to exist, you can use I-DEAS options to select a specific location instead. Then select an edge of your model that is parallel to the axis. Use the direction this edge points to and the right hand rule to determine the direction of rotation. By specifying the axis of rotation with this method, the axis or the point on the axis do not have to be explicitly model in the geometry.

You can specify a *Constant* or a *Time Varying* rate of rotation.

Spinning Spacecraft

A spinning spacecraft spins rapidly around an axis you specify. You also specify the number of calculation positions per spin. For each element, Solar, Earth and Albedo view factors are calculated at each spin position and then averaged.

All elements in the model spin together.

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