Defining Orbital Fluxes

The incident radiation on an element is the product of its view factor to the source times the flux from the source. Specify the solar flux on the *Planet and Sun Characteristics* form.

Before entering any values on this form ensure that you have selected the correct planet on the *Orbit Modeling* form. If you change the planet selection, these values will be overwritten with default values for the planet. Solar flux values should always be verified.

Solar Flux Calculation

If the orbit is around Earth, TMG calculates the solar flux based on sun position. You can specify the sun position in a number of ways; solar declination, either equinox, either solstice, sun right ascension, day number, GMT date or maximum/minimum flux.

The maximum/minimum flux options allow you to specify that the flux value is equivalent to the orbit and the time of year when solar flux is at its maximum or minimum. These options make it easier to simulate the extreme cases for a given orbit.

For non-Earth orbits, specify values for the solar flux, in addition to those for solar declination and sun right ascension.

Modeling Albedo

Account for Planet Flux and Albedo allows you to specify an *Albedo* value and an *IR Flux* (or black body temperature) for the planet. For Moon and Mercury orbits, you must also specify a *Dark Side IR Flux* (or black body temperature).

If you toggle OFF *Account for Planet Flux and Albedo*, planet flux and albedo will not be calculated, but the effect of the eclipse on the model (if any) will be calculated.

The *Use explicit planet model* option creates an explicit finite element model of the planet internally in the TMG solver. For each calculation position, TMG meshes the hemisphere facing the satellite using the specified mesh density. Albedo and planet view factors are then determined by tracing rays from each of the planet elements to the elements of the thermal model. If the rays encounter specular and/or transparent surfaces, then the reflection and/or transmission of the radiative heat from the planet will also be traced.

Planet elements for a given calculation position are arrayed in a radial pattern centered on the closest point to the satellite. *Radial mesh density* defines the number of elements between the pattern's center and its perimeter; *Circumferential mesh density* defines the number of elements around its circumference.
