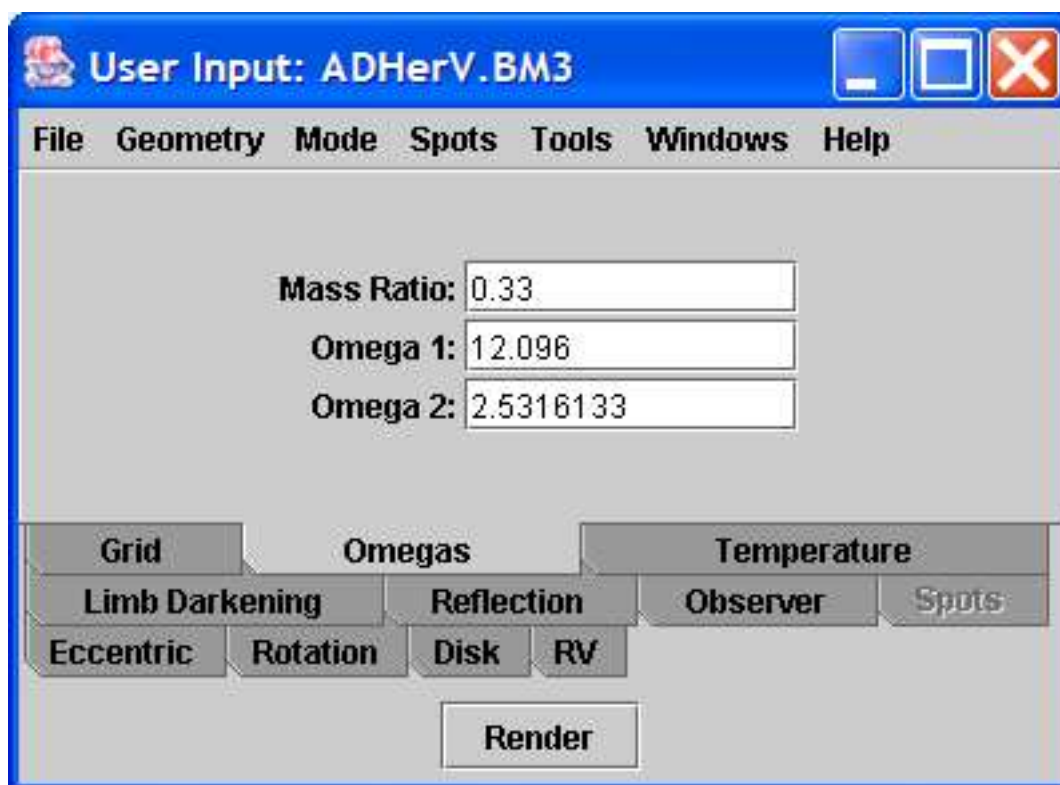# Setting the sizes of the stars

Mass Ratio and **Omega** potentials **Input** boxes

The sizes of the stars in the binary are designated by four different methods, all of which require specifying the mass ratio of the system first. The **mass ratio** is usually defined as the mass of the less massive star (M_2) divided by the more massive component (M_1) , *i.e.*

$$q = \frac{M_2}{M_1}$$

Therefore this quantity is usually less than 1.00. However, *if* the less massive star is hotter than the more massive component, then the deeper eclipse (by convention the *primary* eclipse) will occur when the less massive star is eclipsed. In order to shift the phases by

0.50 to account for this, the mass ratio is inverted, as for W-type W UMa systems. In **Binary Maker 3** this convention is observed, *i.e.*, for hotter secondaries you should input the inverse mass ratio, *i.e.*, greater than 1.0, but star 1 is still considered to be the more massive star and star 2 the less massive one.

Filling the Inner Lagrangian Surface

In order to specify that a star exactly fill its inner Lagrangian surface, type a -1 into the appropriate input box in any of the four input modes.

The four input methods of defining the stellar sizes are:

- Omega potentials (default input mode)
- C potentials
- *a* radius (r_{back} in Wilson-Devinney notation)
- fillout

The input method is set by selecting the desired mode from the **Mode** menu shown below:
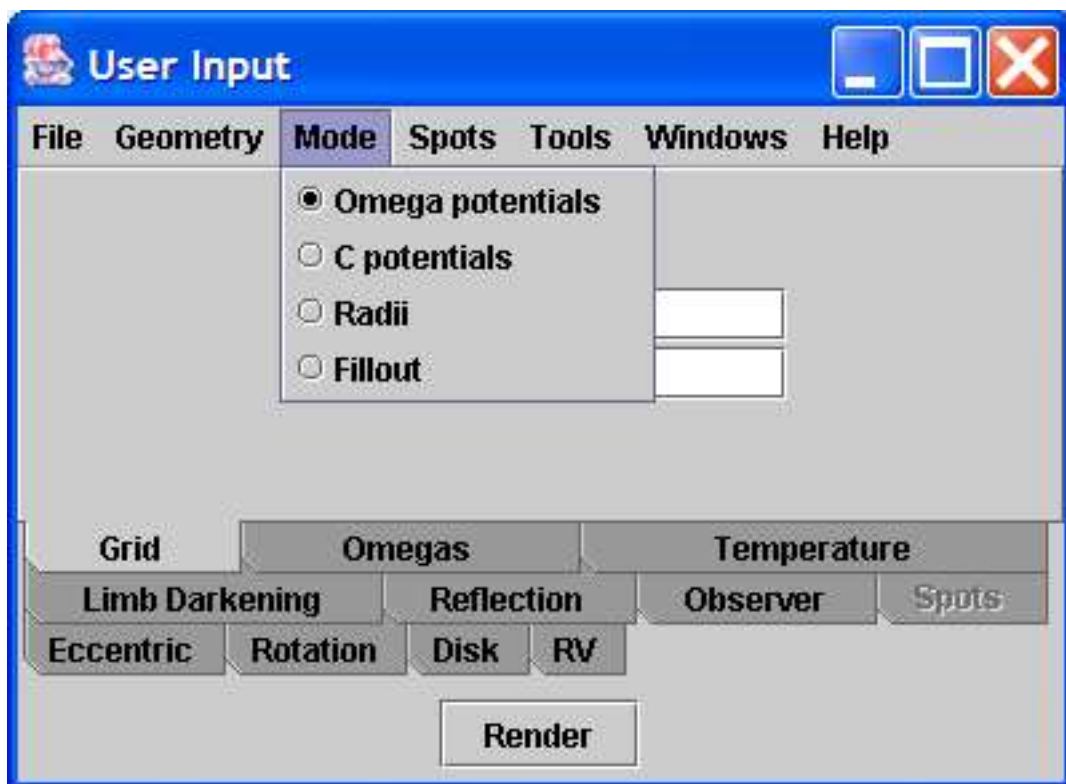
Mode menu showing the four input methods in the **User Input** window