

Setting the sizes of the stars

ile Geome	etry Mode	Spots	Tools	Windows	Help	
	Mass Ra	stio: 0.33	3			
	Omeg	a 1: 12.0	096			
Omega 2: 2.			316133			
Grid	Om	egas		Tempe	erature	_
Grid Limb Dar	Om	egas Reflec	tion	Tempo Observe	erature er S	ipots
Grid Limb Dar Eccentric	Om kening Rotation	egas Reflec Disk	tion RV	Tempe Observe	erature er S	ipots

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:

- <u>Omegapotentials</u> (default input mode)
- <u>Cpotentials</u>
- <u>*a*</u> radius (r_{back} in Wilson-Devinney notation)
- <u>fillout</u>

The input method is set by selecting the desired mode from the Mode menu shown below:

🗟 User li	nput					
File Geome	etry Mode	Spots	Tools	Windows	Help	
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Grid	Om	egas	Temperature			
Limb Darkening		Reflection		Observe	r I	Spots
Eccentric	Rotation	Disk	RV			
		Render				

Mode menu showing the four input methods in the User Input window

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