TABLE 4

ORBITAL PARAMETERS OF THE EXOPLANETARY SYSTEM GLISE 876, G1581, υ AND, 55 CNC, HD160691, HD69830 AND 61 VIR

Object	M kg		a AU	T yr	m kg	K $m^3\ s^{-2}$	$a^3\ T^{-2}$ $AU^3\ yr^{-2}$	$a^3\ T^{-2}/K$
υ And	$2.525 \cdot 10^{30}$ kg							
		1	0.059	0.01	$1.3100 \cdot 10^{27}$	$4.27 \cdot 10^{18}$	1.29	1.02
		2	0.822	0.65	$22.0036 \cdot 10^{27}$	$4.31 \cdot 10^{18}$	1.31	1.03
		3	2.550	3.57	$19.5356 \cdot 10^{27}$	$4.30 \cdot 10^{18}$	1.30	1.03
55Cnc	$1.97 \cdot 10^{30}$ kg							
		1	0.038	0.01	$0.0456 \cdot 10^{27}$	$3.36 \cdot 10^{18}$	0.92	0.93
		2	0.115	0.04	$1.5644 \cdot 10^{27}$	$3.36 \cdot 10^{18}$	0.95	0.95
		3	0.240	0.12	$0.3209 \cdot 10^{27}$	$3.36 \cdot 10^{18}$	0.94	0.95
		4	0.781	0.71	$0.2734 \cdot 10^{27}$	$3.36 \cdot 10^{18}$	0.94	0.95
		5	5.770	14.29	$7.2808 \cdot 10^{27}$	$3.37 \cdot 10^{18}$	0.94	0.95
61 Vir	$1.8890 \cdot 10^{30}$ kg							
		1	0.050	0.01	$0.0304 \cdot 10^{27}$	$3.19 \cdot 10^{18}$	0.95	1.01
		2	0.218	0.10	$0.1088 \cdot 10^{27}$	$3.19 \cdot 10^{18}$	0.95	1.01
		3	0.476	0.34	$0.1367 \cdot 10^{27}$	$3.19 \cdot 10^{18}$	0.95	1.01
HD69830	$1.71 \cdot 10^{30}$ kg							
		1	0.079	0.02	$0.0627 \cdot 10^{27}$	$2.89 \cdot 10^{18}$	0.86	1.01
		2	0.186	0.09	$0.0721 \cdot 10^{27}$	$2.89 \cdot 10^{18}$	0.86	1.01
		3	0.630	0.54	$0.1101 \cdot 10^{27}$	$2.89 \cdot 10^{18}$	0.86	1.01
HD181433	$1.55 \cdot 10^{30}$ kg							
		1	0.080	0.03	$0.0452 \cdot 10^{27}$	$2.62 \cdot 10^{18}$	0.78	1.00
		2	1.760	2.63	$1.2150 \cdot 10^{27}$	$2.62 \cdot 10^{18}$	0.79	1.01
		3	3.000	5.95	$1.0252 \cdot 10^{27}$	$2.62 \cdot 10^{18}$	0.76	0.99
Glise876	$1.55 \cdot 10^{29}$ kg							
		1	0.021	0.01	$0.0399 \cdot 10^{27}$	$1.12 \cdot 10^{18}$	0.32	0.97
		2	0.130	0.08	$1.3559 \cdot 10^{27}$	$1.13 \cdot 10^{18}$	0.32	0.97
		3	0.208	0.17	$4.3202 \cdot 10^{27}$	$1.13 \cdot 10^{18}$	0.32	0.97
		4	0.334	0.34	$0.0873 \cdot 10^{27}$	$1.12 \cdot 10^{18}$	0.32	0.97
G1581	$6.16 \cdot 10^{29}$ kg							
		1	0.030	0.01	$0.0116 \cdot 10^{27}$	$1.04 \cdot 10^{18}$	0.36	1.18
		2	0.041	0.01	$0.0934 \cdot 10^{27}$	$1.04 \cdot 10^{18}$	0.32	1.04
		3	0.070	0.04	$0.0320 \cdot 10^{27}$	$1.04 \cdot 10^{18}$	0.27	0.89
		4	0.220	0.18	$0.0424 \cdot 10^{27}$	$1.04 \cdot 10^{18}$	0.32	1.04

In the Columns 1 to 5, the names of the bodies, the mass of the star, the major semi-axes, their periods and the planet masses, are given. In Columns 6 and 7 the values of the proportionality parameter of Kepler for each body, and the quotient are given, and finally, in Column 8 we give the quotient of these parameters of proportionality, whose value is very close to one.

the following equations (TBF):

$$r_n = 0.008 + 9.6 \cdot 2^{n-6}, \qquad -4 \leq n \leq 1 \qquad (6)$$

$$r_n = 0.4 \quad + 9.6 \cdot 2^{n-7}, \qquad 2 \leq n \leq 8 \qquad (7)$$

$$r_n = 19.6 \ + 9.6 \cdot 2^{n-9}. \qquad n \geq 9 \qquad (8)$$

Now we present the distribution of the objects that induces each of the equations (6–8) in order to discern their tendencies and to display the intervals that are valid in each (the values of χ^2 for each interval are 0.002, 0.241 and 0.379 respectively). It is obvious that there are three regions bound by the intersection of the equations (6) and (7), and equations (7) and (8) (Figure 8) and whose approximate values are found to be $(n_1, r_1) = (2.5,\ 0.8\ \text{AU})$ and $(n_2,\ r_2) = (8.4,\ 26.5\ \text{AU})$, respectively. This suggests that these three intervals delimit the regions between the Sun and Venus, inside the region of the hypothetical vulcanoid objects that contains Mercury, between Major Solar Bodies but without Mercury, and finally from Neptune to the regions of the outer Solar System, into which we have included the accumulation points (m_1, m_2, m_3, m_4, m_5, m_6 and m_7).

Taking equations (6–8) we have determined the values of the semi-major axes and have fitted exponential functions (values of R^2 as 0.9999, 0.9971 and 0.9999 respectively):

$$r = e^{0.63413x - 1.81942}, \qquad x < 2 \qquad (9)$$

$$r = e^{0.67115x - 2.38121}, \qquad 2 \leq x < 9 \qquad (10)$$

$$r = e^{0.68879x - 3.89173}. \qquad x \geq 9 \qquad (11)$$

Since equation (9) represents the vulcanoid objects we wish to compare it with the semi-major axes