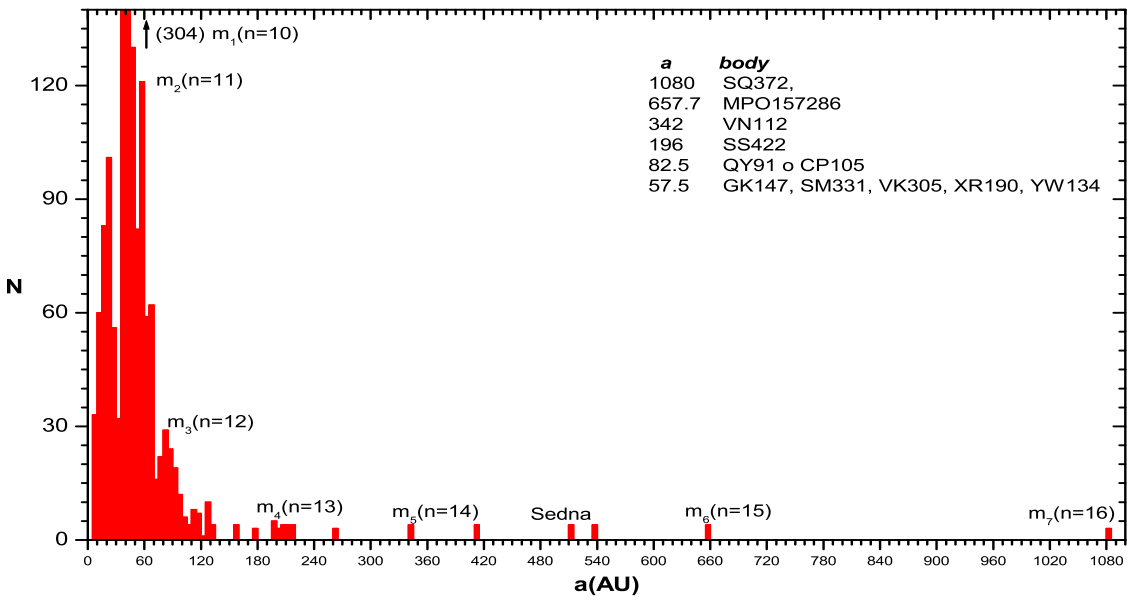

Fig. 4. Regions of accumulation in the Solar System of the small planetary bodies (taken from IAU Minor Planets Center: Observable Distant Minor Planets Orbital Elements). We observe that several of the small objects of the Solar System, like Eris, 2006HQ or Sedna, cannot be associated to the Titius-Bode Law. The color figure can be viewed online.

Third Law. If we apply this procedure to each of the models in Table 1 we will have an overview of the degree of certainty that the models possess as a whole.

The fit in Figure 3 shows the ratio between the values calculated for each model and the observed parameters. We can see that there are certain similarities up to the planet Saturn. However, there are divergences when we approach the outer regions of the Solar System. Note that the trace shows the smallest difference with the data for planetary objects due to the lower percentages of up to 10%. In this figure it is easy to identify the problem arising in all the models when reproducing the parameters of the planet Mercury; therefore it is normally avoided with an *ad hoc* number applied to this planet.

Another aspect that we want to emphasize is the fact that when general models are proposed what is implicitly done is to change the pattern of the sequence of integers for that of real numbers given by continuous functions $T = f(r)$. Thus, any Solar System object in principle will also fulfill this function and also the TB Law.

Given the large number of solar bodies now known we noticed that they fall on the semi-major axis distribution, although we know small objects like Eris, 2006HQ or Sedna that cannot be associated to the integers succession of the Titius-Bode Law. In the case of Ceres, which has historically been associated with the fifth place in the TB Law, we must say that we now know of the existence of a large number of other, smaller, planetary bodies whose orbital parameters are closer to the fifth place in Titius Bode's law.

With the intention of identifying the regions of the major accumulation of small planetary objects, we set ourselves the task of assembling the information (Figure 4) of IAU Minor Planets Center (Observable Distant Minor Planets Orbital Elements). We compare their semi-major axis accumulation points with the values corresponding to every integer n of the TBmod succession. The result indicates to us that only seven regions (m_1, m_2, m_3, m_4, m_5, m_6 and m_7) can be associated with some integer 10, 11, 12 (2002TC30), 13 (Ceto), 14, 15 and 16 respectively, which makes us see the generic representation of the Titius Bode Law.

Another aspect that we want to review is whether the distribution of planets in our Solar System could be compared with that of extrasolar systems (often very different from ours), and so we enquired whether the TB model could be applied to such planetary systems.