

Quantum gravitational effects in formation of detached double-lined eclipsing systems (DDLESeS)

S V Sinitsyn
s.sinitsyn@mail.ru

Introduction. The DDLESeS consists of two very close stars which are the first and second components. The distance between these components is on the order of 1 or 10 solar radii. Indexes 1 and 2 indicate the first and second components, respectively.

If a quantum gravitational effect is carried out along the coordinate axis of the ratio of the values of any parameter of the first and second components, then it is of the second or third type.

The distributions of the DDLESeS are constructed using empirical data from catalogs [1 - 4].

The quantum gravitational effect of the second type is found along the coordinate axis M_1/M_2 . Therefore, this effect is found in the formation of the first and second components.

Figure 1 shows the distribution of the DDLESeS, the components of which have masses from 0.445 to 13.82 solar masses.

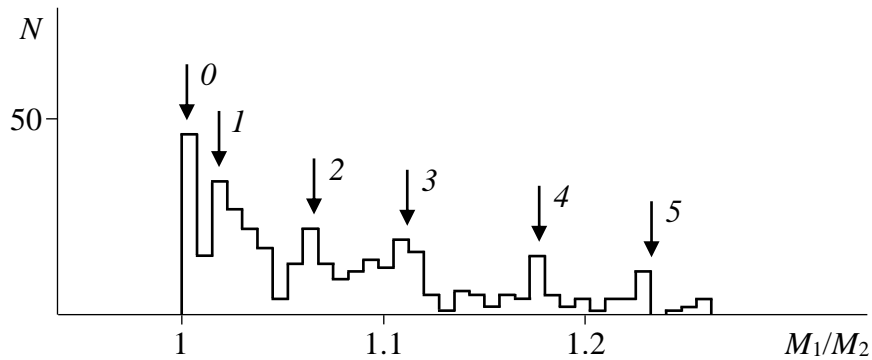


Figure 1. The distribution of 375 detached double-lined eclipsing systems.

Six peaks are visible, the positions of which are determined as

$$M_1/M_2 = 0.0155n + 1.0187, \quad n = -1, 0, 3, 6, 10, 14$$

The quantum gravitational effect of the third type is found along the same coordinate axis about $M_1/M_2 = 1.0187$. Figure 2 shows the distribution of the DDLESeS.

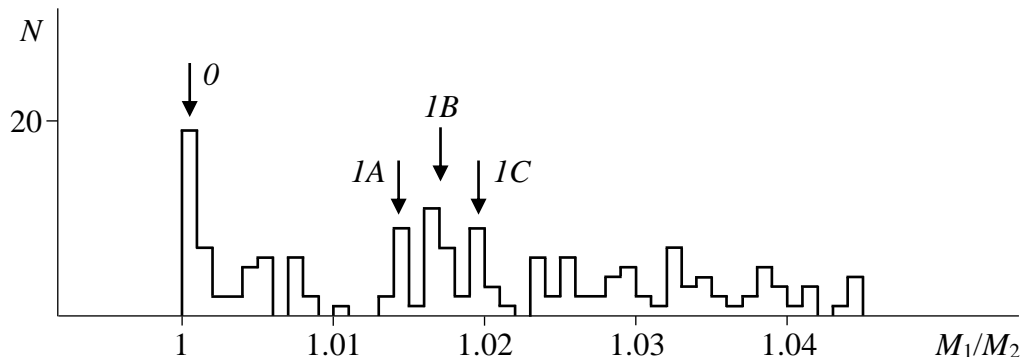


Figure 2. The distribution of 161 detached double-lined eclipsing systems.

At $M_1/M_2 = 1.0169 \pm 0.0005$ the symmetric separation of the populated area into three such areas (peaks IA , IB , IC) is visible.

Conclusion:

The found effects are due to these facts:

1. The peaks are created by the populated areas of the coordinated formation of the first and second components.
2. The formation of the first and second components is coordinated.
3. There is some quantum physical system which creates the coordinated formation of the first and second components. Moreover, this system is also the measuring instrument of the gravitational masses of these components.
4. This quantum physical system exists already before the formation of component bodies from baryonic matter.
5. A general gravitational mass of the DDLES is proposed as the quantum physical system.
6. The formation of the DDLES begins with the formation of own general gravitational mass. Then the latter begins to capture the gravitational masses of atoms. Moreover, it captures not any, but an agreed amount of them, while coordinating the formation of the bodies of the first and second DDLES components from baryonic matter.

References

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