



## **The influence of internal friction on the early processes of the formation of the Earth-Moon system**

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The study of the evolution of the moon is of exceptional interest for the knowledge of the processes occurring on the Moon and the Earth, the formation of the internal regions of these bodies. Of undoubted interest is the study of the material composition of the surface of the planetary body nearest to Earth, which allows us to specify information about the processes in the protoplanetary cloud and the early stages of the accumulation of planets. We were faced with the task, using the model of terrestrial planets accumulation proposed in [1-3], to conduct numerical simulations of the temperature distribution in the inner regions of the planet for successively increasing with time values of the body radius in the 3D environment model as a member of the Earth-Moon binary system. In addition to the results of [2], the evolutionary feature of the accumulated Moon was investigated not only with regard to falling heterogeneities differing in size, composition and velocity of impact with the growing surface of the Earth, but also taking into account the release of heat of viscous friction in the bodies of the Earth and Moon. It is shown that, in the course of evolution, heat dissipation of internal friction could affect the angular velocities of the Earth's rotation, the angular velocity and the radius of the Moon's orbit, and the character of the differentiation processes of the inner regions of the Earth and the Moon.

1. Anfilogov V.N., Khachay Yu.V. Possible variant of matter differentiation at the initial stage of Earth's forming. *DAS*. 2005, V. 403, No 6, pp. 803-806.
2. Anfilogov V., Khachay Yu. Some aspects of the solar system formation. *Briefs of the Earth Sciences*. Cham, Heidelberg, New York, Dordrecht, London: Springer; 2015. 75p.
3. Khachay Yu., Hachay O., Antipin A. Dynamics of the Early stage of Formation of the Earth-Moon system. *Geophysics*, ed. by Anthony Okiwelu . Intechopen. 2018 . pp.119-131.