# ON THE COUNTERFLOWS OF MATTER IN SELF–GRAVITATING SYSTEMS

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Characteristics of the opposite rotation of matter in self-gravitating systems are discussed. It was shown that counterflows could arise from accretion of matter in asymmetric gravitational fields in the presence of considerable turbulence. It was formed a hypothesis of existence of a massive Sun's nucleus which revolves in the opposite direction than solar atmosphere does. On the base of this hypothesis it was attempted to explain the problem of angular momentum of the solar system and a possible source of solar oscillations.

The opposite rotation of different components of self-gravitating systems begets counterflows of matter. Such phenomenon has been discovered at first in the solar system. Some external planetary satellites have orbital motion that is opposite to the direction of revolution of their planets [8]. Later, the existence of counterflows of matter has been found in some gaseous dust clouds of interstellar medium where a nucleus and an envelope revolve in opposite directions [10, 11]. Detailed modern investigations have allowed to discover the opposite rotation of nuclei in some elliptical galaxies [2, 4, 5]. Now, the counterflows have been found in spiral galaxies where some portion of the stellar component rotates in opposite direction [6]. The opposite rotation of gaseous dust components (*i.e.*, disks and rings) with respect to the stellar component has been discovered in many elliptical galaxies [3, 9]. In our Galaxy the portion of globular stellar clusters has the orbital motion which is opposite to the orbital motion of other galactic components [7].

Foregoing facts acknowledge that the phenomenon of counterflows in self-gravitating systems exists in the wide range of masses and sizes of space bodies. Therefore, it may have common origin.

According to our investigations, an accretion of matter can cause such a process in asymmetric gravitational fields in the presence of considerable turbulence in the medium. The approximate solution of the dynamical equations of accretion in elliptical galaxies indicates the possibility of appearing the counterflows of stellar and gaseous dust components, if asymmetry of gravitational field exists [1]. It is possible to suppose that opposite rotation of a nucleus and an envelope exists in binary systems where synchronization between the self-rotation and the orbital motion is not reached. Using the existence of counterflows in the solar depths, it is possible to explain the problem of angular momentum of the solar system. If full angular momentum of the solar system is supposed to be approximately compensated, then a massive nucleus, which rotates inversely with respect to the Sun's envelope, should exist. If the radius of the Sun nucleus is approximately 0.2 the Sun radius, then it should rotate in opposite direction with the period about $40^m$.

Approximate hydrodynamical evaluations indicates that the opposite rotation of the Sun nucleus leads to appearance of a turbulent stratum between the nucleus and the atmosphere. The global circulation of matter arises in this turbulent zone. It can serve as a stimulus of global solar oscillations with period about $160^m$. Merger of Sun's rotation peculiarities and the large-scale turbulence can serve as a mechanism of amplification of internal magnetic field and its modification during some period.

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