



Large-scale changes of the atmosphere (climate), geodynamics and biosphere due to the galactic shocks

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The Solar system periodically passes through spiral arms of the Galaxy, which are stellar density waves. Processes due to the presence of galactic shocks (shock waves) may be responsible for the abrupt atmosphere changes (climate), geodynamics (supercontinental cycle, large tectonic processes, mantle convection, geomagnetic field and others) and biosphere. Galactic shocks (GS) are the narrow region of high gas compression along the inner edge of spiral wave. Shock wave leads to the interstellar dust compression and to the phase transition in the interstellar gas. GS are large-scale trigger mechanism of active star formation. GS ultimately changes temperature, pressure and the radiation balance. It is quite surprisingly that majority of the "data points" of the geochronological and stratigraphic scales are closely related to the time moments when the Solar system has passed through the galactic shocks. This extraterrestrial cause for the change of physical and chemical conditions on the Earth had profound effects on the biologic extinction and explosions. This hypothesis explains the biologic explosion in Cambrian, the Permian – Triassic and Cretaceous-Tertiary extinctions, i.e., the beginning of Paleozoic, Mesozoic and Cenozoic. It is valid in the frame of galactic shock model that any discussion time estimates of these past events and their implications for the future must be quantitative. It will permit an evaluation of age of greater catastrophes and changes in the Earth history, of the future meets with the spiral arms of the Galaxy. It predicts the existence of chronological scales of other planets.