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Modelling global cycle of carbon dioxide in system of atmosphere-ocean

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A studying the global warming phenomenon, global cycle of the carbon dioxide etc attract a great interest. The purpose of this paper is carrying out the detailed model of the CO2 global turnover in system of "atmosphere-ocean". Practically all carried out models are functioning in the average annual regime and accounting for the carbon distribution in biosphere in most general form (Glushkov et al, 2003). We construct a modified model for cycle of the carbon dioxide, which allows to reproduce a season dynamics of carbon turnover in ocean with account of zone ocean structure (up quasi-homogeneous layer, thermocline and deepest layer). It is taken into account dependence of the CO2 transfer through the bounder between atmosphere and ocean upon temperature of water and air, wind velocity, buffer mechanism of the CO2 dissolution. The same program is realized for atmosphere part of whole system. It is obtained a temporal and space distribution for concentration of non-organic carbon in ocean, partial press of dissolute ÑÎ2 and value of exchange on the border between atmosphere and ocean. It is estimated a role of the wind intermixing of the up ocean layer. The increasing of this effect leads to increasing the plankton mass and further particles, which are transferred by wind, contribute to more quick immersion of microscopic shells and organic material. It is fulfilled investigation of sensibility of the master differential equations system solutions from the model parameters. The master differential equations system, describing a dynamics of the CO2 cycle, is numerically integrated by the four order Runge-Cutt method under given initial values of valuables till output of solution on periodic regime. At first it is indicated on possible realization of the chaos scenario in system. On our data, the difference of the average annual values for the non-organic carbon concentration in the up quasi-homogeneous layer between equator and extreme southern zone is 0.15 mol/m^3, between the equator and extreme northern zone is 0.12 mol/ì^3. the maximum amplitude of season oscillations

(40˚-50˚n.l.) is 0.07 mol/ i^3. A link between global cycle of carbon dioxide and global climate change is investigating.

Refrences:

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