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# Space-time based evolution of pollutants in the planetary boundary layer

BACKGROUND: In this article, we focus on environmental protection and sustainable development, in particular the control of air pollutants and greenhouse effect (GHG). In a nutshell, the prevalence and impact of the consequences on the atmospheric boundary layer (PBL) and the recurring interests of the PBL study are the understandable aspects of the solutions offered by physicists.

OBJECTIVE: We present a physical model that unifies the transport and dispersion of chemical elements in the atmosphere; In our case, we are interested in the pollution by carbon dioxide that occurs at the planetary boundary layer. Thus, the source of pollution is assimilated to a point of which density should increase strongly due to a limnic or phreatic eruption.

This source is located in the lake. In addition, Lake Nyos is a maar with basaltic scoria scones. Our field of research is in accordance with national policies and the efforts of researchers who tend to materialize the interdependence between the practice of experimental sciences and the search for solutions to the natural phenomena that have a hold on human life. Thus, in order to follow the evolution of this phenomenon of atmospheric pollution, we combine the WKB approximation with the Sturm-Liouville problem and we arrive at a form of well-known solution in Gaussian form.

INTERVENTION: This model takes into account hydrological and meteorological parameters in a heterogeneous vital environment. The study is related to the K-theory according to which the flux of turbulent concentration is proportional to the average concentration gradient. Therefore, the mathematical development of the advection dispersion equation associated with homogeneous boundary conditions leads to a closed-form analytic solution of the Advection dispersion equation.

MAIN RESULTS: The performance of the model is evaluated by statistical parameters (Hanna and Chang, 2009), whose data were collected during the Pararie Grass measurement campaign (ML BARAD, 1958), Convergence of the solution according to the theoretical model and the model Experimental, shows that this process can be used for simulating the dispersion of pollutants in the atmosphere. The concordance of the results and the data found in the literature show that it is therefore possible to evaluate the evolution of the concentration with the distance as a function of the different heights of the source.

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