Computational Analysis of the behavior of atmospheric pollution due to demographic, structural factors, vehicular flow, and commerce activities

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According to the latest assessments made by the world health organization (WHO-2016), the atmospheric pollution (air), has become one of the main causes of morbidity and mortality in the world, with a steep growth of respiratory diseases, increase in lung cancer, ocular complications, and dermis diseases [1-3]. Currently, there are governments which still underestimate investments in environmental care, turning their countries into consumerist only systems and predators of the ecosystem [1-3]. Worldwide, several cities have been implementing different regional strategies to decrease environmental pollution, however, these actions have not been effective enough and significant indices of contamination and emergency declarations persist [1-3]. The city of Medellín is one of the cities in Latin America most affected by polluting gases, due to the high growth of construction, high vehicular flow, increase in commerce, besides a little assertive arborization system, among other reasons [1-3]. With the purpose of providing new researching elements which benefit the improvement of air quality in the cities of the world, it is pretended to mathematically model and computationally implement the behavior of the flow of air, e.g., in zones in the city of Medellín to determine the extent of pollution by tightness, impact of current architectural designs, vehicular transport, high commerce flow, and confinement in the public transport system. The simulations allowed to identify spotlights of particulate tightness caused by architectural designs of the city which do not benefit air flow. Also, recirculating gases were observed in different zones of the city. The current research can offer greater knowledge around the incidence of pollution generated by structures and architecture. Likewise, these studies can contribute to a better urban, structural and ecological reordering in cities, the implementation of a more assertive arborization, and the possibility to orientate effective strategies over cleaning (purification) and contaminant extracting systems.

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