MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Poster Session (P)

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A POSSIBLE FUTURE NEED OF AN ENFORCED THERMAL CONTROL OF THE EARTH

Abstract

For the past centuries humans have been conducting activities aiming to improve quality of life, but sometimes significantly changing the original condition of the Earth surface. These changes can be witnessed at the deforestation process, the ever increasing phenomenon of urban building constructions, the swapping of original land vegetation by large areas of plantations, etc. These activities are changing the face of our planet. Such surfaces used to hold their original characteristics of thermal-optical properties of absorptivity, reflectivity and emissivity of thermal radiation. The new altered Earth surfaces not necessarily will have properties as before. Large areas that used to mostly reflect solar radiation perhaps nowadays are significantly absorbing incoming solar energy, making their regions warmer. Inverse situation can be true for other regions. Large Earth regions could be experiencing changes in their local thermal balance accounted by changes in their thermal optical properties, significantly altering its temperature. With this analysis and motivation in mind this work aims to firstly stimulate the global community about this phenomenon, then to present proposal to mitigate possible changes in the Earth climatic conditions caused by this issue. The first part suggests deeper studies to better understand this phenomenon, then a comprehensive space project should be addressed, involving a satellite-based system for measurement, mapping and monitoring the resultant radiative heat flux found on Earth surface, including the use of a large number of ground stations around the globe fitted with radiometers, added to sensors installed in the orbiting satellites. This system will provide accurate and updated information about the thermal balance of the Earth surface in terms of radiative heat fluxes. For a complete thermal analysis, other atmospheric phenomena shall be included and it is not in the scope of this study. Finally, is a consideration of a planned global action in the future in terms of enforcing and controlling the thermal-optical properties of regional surfaces of the Earth. In an internationally coordinated effort, this includes a careful and appropriate selection of soil and building upper surface construction materials, as well as large plantation areas, all presenting specific optical surface finishing. All these shall involve future developments in the civil and geological engineering, and also agricultural engineering and biology for a possible need of genetic changes in the plant leaves to attend requirements of thermal optical properties. This paper addresses and discusses details about this consideration. Keywords: Thermal Radiation, Thermal-Optical Properties, Earth Climatic Change