

Proposal for F/O of global sensor (SGLI / GCOM-C)

*本多 嘉明¹、村上 浩²、堀 雅裕²

*Yoshiaki HONDA¹, Hiroshi Murakami², Masahiro Hori²

1. 千葉大学環境リモートセンシング研究センター、2. 宇宙航空研究開発機構 地球観測研究センター

1. Center for Environmental Remote Sensing, Chiba University, 2. Japan Aerospace Exploration Agency Earth Observation Research Center

Japan Aerospace Exploration Agency (JAXA) had launched new Earth observation satellite GCOM-C in the end of 2017. The core sensor of GCOM-C, Second Generation Global Imager (SGLI) has a set of along track slant viewing Visible and Near Infrared Radiometer (VNR). These multi-angular views aim to detect the structural information from vegetation canopy, especially forest canopy, for estimating productivity of the vegetation.

Global averaged air temperature has recently been rising. According to the fourth assessment report published by the Intergovernmental Panel on Climate Change (IPCC) in 2007, the temperature increase is expected to continue throughout this century (see figure below). However, uncertainties in the temperature predictions are still quite large about 2 degree Celsius. The uncertainties result from the difference in the implementation method of individual physical processes among different climate models. The environmental effect of the air temperature increase can differ significantly depending on whether the increase exceeds 3 degrees C or not. For example, if the increase does not exceed 3 degrees C., crop yield is projected to increase. However, if the temperature increase exceeds 3 degrees, crop yield is expected to drop. It is thus necessary to choose an appropriate emission scenario and to precisely predict temperatures in order to prevent the air temperature from rising beyond 3 degrees C. in the future.

Land and ocean currently act as natural sinks of carbon dioxide (CO₂) through ecosystem activities and prevent the rate of its accumulation in the atmosphere from increasing. However, there are still large uncertainties in the current estimation of CO₂ absorption. A further unknown factor is the persistency of the ability of land and ocean to absorb CO₂ in a warmed world.

GCOM-C aims to conduct long-term observations to monitor the distributions of land and oceanic vegetation and global surface temperature in order to understand the absorption and emission processes of CO₂ by the ecosystem and to contribute to improving land and ocean processes in numerical climate models.

Maintaining the global ecosystem is indispensable for human beings to continue sustainable development in the future.

It is necessary to constantly monitor changes in the global environment.

Japan is also responsible for fulfilling part of it in order to continue prosperity in the world. Long-term continuous observation by the successor will show the significance of existence in this field of Japan.

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