CHARACTERIZATION OF AIR QUALITY IN GOBAL MEGA-CITIES BY REMOTE SENSING AND INVENTORY DATA

Aya Fujikawa and Wataru Takeuchi [1]

[1]*Institute of Industrial Science, The University of Tokyo,*

4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan; Tel: + 81-3-5452-6410;

E-mail: ayafuji@iis.u-tokyo.ac.jp

KEY WORDS:

MOPITT, OMI, Angstrom exponent, Aerosol Optical Depth, NO2

ABSTRACT:

According to previous study, aerosol is classified into two types –natural or artificial. However, it isn't so clear that what rate does aerosol contain in the air and how much two types aerosol affects. The objective of this study is to clear the relation between air pollution and human activity, so we use indexes as angstrom exponent (ANG), Aerosol Optical Depth (AOD) by MODIS and NO2 by OMI.

Firstly, aerosol condition was classified by ANG-AOD. A scatter plot was made about 60 mega cities. Air conditions of cities are revealed three characteristics- the environmentally friendly cities(European cities, Tokyo, New York, etc)・the cities influenced artificial aerosol(Shanghai, Lagos, etc)・the cities influenced natural aerosol (Kabul, Baghdad, etc).

Secondly, the origin of air pollution was classified as urban transport, industry or forest fire by NO2. The value of ANG-AOD was transformed to the value of RGB color space. Not only chosen cities but also cities where are not chosen and the other areas are categorized.

Thirdly, the extraction result of urban transport was analyzed by comparing the data of ANG-AOD and the inventory data of the volume of traffic. The value of R divides the origin of transform from the others.

From these results, the influence is grasped that the urban traffic gives to air pollution all over the world in almost real time. These results are collated with data (the number of vehicle, the degree of traffic jam and so on) and shown which field of the urban traffic strongly has an influence on the air pollution. In the future, the result of this research could be an index of the choice to invest for the air pollution improvement.