Preliminary Result of Aerosol Optical Properties from the Observatory for Atmospheric Research at Phimai, Nakhon Ratchasima, Thailand

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Abstract

Aerosol is an atmospheric constituent that is high temporal and spatial variation. The aerosol effects have not yet cleared due to lack of data and complex behaviors in the atmosphere. The observatory for atmospheric research at Phimai, Nakhon Ratchasima was established in 2005 in order to observe aerosol variation and related parameters. It is only one observatory that located in Southeast Asia. The objective of this study is to investigate the variation of aerosol optical properties from the observatory from May 2005 to April 2006. The properties consist of aerosol optical depth (AOD), Angstrom exponent and single scattering albedo (SSA).

According to aerosol optical properties, we can divide aerosol at the observatory for atmospheric research at Phimai, Nakhon Ratchasima into 4 groups as below;

The first group consists of coarse mode aerosol with high absorption aerosols. They suspend in the atmosphere during August to September which is rainy season. It may be local dust that is compound of iron oxide or hematite. Resulting is low SSA aerosol distributed during this period. SSA are 0.77±0.15, 0.79±0.15 and 0.86±0.17 in channel 0.4, 0.5 and 0.87 μm, in respectively.

The second group is major by coarse mode aerosol and low absorption. It is possibly consisted of rock salt (halite) that exposes near the study area or the other soluble aerosol. This group of aerosol is found in during October to December. The second group of aerosol is coarser than the first group because of the lower Ångstrom exponent.

For the third and forth group of aerosol, they are fine mode aerosol which Ångstrom exponent are 1.13±0.25 for the third group and 1.15±0.40 for the forth group. The different between these two groups is SSA that is lower for the third group. SSA of the third group of aerosol is 0.78±0.11, 0.76±0.13 and 0.77±0.12 for the different wavelength that express absorbing aerosol characteristic. Therefore, they may be the aerosol from biomass burning under long flaming stage that suppose with low humidity during January and February. The forth group appear during March to April which is the crop preparation period.