

Transboundary pollution in association with "cold surge" phenomena

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Tropospheric ozone plays crucial roles on the environment in the lower troposphere. In southeast Asia, active biomass burning and increasing human activities may increase the tropospheric ozone. In addition, transboundary transport of polluted air from China and/or India may affect the tropospheric ozone in this region.

We have continuously monitored surface ozone and carbon monoxide concentration at Phimai, mid-east Thailand since 2007. Variations of the ozone and CO concentration are discussed in terms of the backward trajectories from Phimai. While they were very low in the wet season between late May and September, when monsoon brings air masses over Indian Ocean, they significantly increased during the dry season. In the early dry season, between late October and December, they repeatedly increased and decreased. A meteorological analysis indicates that this semi-oscillating phenomenon occurred in association with the "cold-surge" phenomenon, which transports relatively cold and high-pressure air from the inland of Asian continent, leading to transboundary transport of heavily-polluted air masses over south China. In the late dry season, a westerly wind brought polluted air in the southern urban areas such as Bangkok. In addition, increasing diurnal variation of CO implies that biomass burning in the surrounding area affected the CO and ozone level.

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