## Abstract

Artificial nightlight emitted from buildings and road lights in the city area were extracted by using a noise reduction filter (NRF) from Defense Meteorological Satellite Program/Optical Linescan System (DMSP/OLS) nighttime imagery which observed during the year 1999. The NRF finds harmonic signal component and its bias from each pixel of the time series imagery and other random signals are eliminated as the noises. We applied this NRF to the DMSP /OLS time series dataset. If pixels contained stable values through the time series dataset, then those stable values are extracted as the bias components. And those are defined as artificial nighttime lights. However, the levels of extracted those artificial lights were shifted by the season and its latitude.

To clarify the shift of the level, we applied spectral analysis by the Fast Fourier Transformation (FFT) to 120 mosaic images which were generated from daily DMSP/OLS data of the year 1999. The result of the FFT analysis showed that the shift of the level was a 1-year cycle component that was affected by sunlight.

Then, we developed an improving method of the artificial nightlight extraction by removing 1-year cycle component from the artificial light. And we made a comparison of the difference between the artificial lights extracted by NRF and our method by using four selected pixels at different latitude in the study area, and it was confirmed that the level of the bias were corrected by our method.