

Application of independent component analysis to the variability of the Bonin High in summer

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Recently, a new statistical tool, independent component analysis(ICA), comes into use in many scientific fields successfully. In contrast to principal component analysis(PCA also known as EOF analysis), ICA assumes the statistical independence among the hidden original signals in addition to uncorrelatedness.

Recently, our group have applied this method to Arctic Oscillation and got some implications. This is another attempt to apply ICA to the meteorological data.

There exists year-to-year variability of the North Pacific High or the Bonin High around the eastern part of the Eurasian Continent. The mechanism of the variability is still controversial. In order to clarify the cause of the variability, ICA is applied to the geopotential heights of several pressure levels over the Eurasian Continent in summer.

I will show that the variation of the geopotential heights seems to be successfully separated according to the heat sources, though those results could not be obtained by PCA.