

Timeseries of the Meridional Heat transfer in the North Pacific Ocean.

*Yukina Fukami¹, Kazuyuki Uehara¹

1. The Graduate School of Marine Science and Technology of Tokai University

To obtain time-series of the meridional heat transfers in the North Pacific Ocean, we used ARMOR3D datasets which were brought by CMEMS. The meridional heat transfers were calculated as follows; firstly, we converted depth in meter to pressure in dbar, then computed the potential temperature, the potential density, and the specific heat which is a function of temperature, salinity, and pressure (Fofonoff and Millard, 1983). The meridional heat transfer on a latitudinal section for trans-Pacific at a certain time was computed by these values and the north-south geostrophic velocities. At the same time, northward heat transfer of the western boundary current was computed. We finally obtained the time series of the meridional heat transfers from 1993 to 2018. As a result, we found that the net meridional heat transfers for 26 years at the 25°N section and 30°N section are in the northward direction, and its fluctuations in net heat transfer are mainly determined by that of the western boundary current. In 1997-1998, it is the largest El-Nino in the 20 century, the northward heat transfer increased by 1 PW in particular. The net meridional heat transfers at the 35°N section, which is located at the boundary of the subarctic and subtropical gyres, were very small in magnitude, but northward transfers with the Kuroshio and Kuroshio Extension are reached about 3 PW. At the time of our presentation, we plan to discuss the time fluctuation of the meridional heat transfer in detail.

Keywords: heat transfer, subtropical gyre, North Pacific Ocean