

Eddy Induced Transport of Saline Kuroshio Water Into the Northern South China Sea

*Tao Xing^{1,2}, Yikai Yang²

1. MLR Key Laboratory of Marine Mineral Resources, Guangzhou Marine Geological Survey, 2. South China Sea Institute of Oceanology, Chinese Academy of Sciences

To better understand eddy induced heat and salt transport, a targeted joint hydrographic investigation focusing on an anticyclonic eddy was carried out in July 2017 in the northern South China Sea. In situ and satellite observations together with Hybrid Coordinate Ocean Model output show the transport of subsurface saline Kuroshio water into the northern South China Sea by an anticyclonic eddy. Subsurface high salinity cores are consistent with the anticyclonic eddy centers. The transport of saline Kuroshio water occurs in two stages accompanied by eddy shedding. First, saline Kuroshio water is trapped within the anticyclonic eddy at its generation location. Then, although the salinity within the eddy gradually weakens as the eddy carries the saline water westward, the quantity of saline water shows a sharp increase, dominated by eddy induced salinity advection. A diagnosis of the salinity budget further confirms that the contribution of eddy flow advection is greater than that of mean flow advection. The saline Kuroshio water is trapped and conveyed in this anticyclonic eddy, providing vital evidence and important implications for eddy induced salt transport and water exchange.

Keywords: mesoscale eddy, Kuroshio, Northern South China Sea, salt transport

