

Bottom Pressure Variation in Association with the 2017-Present Large-meander of the Kuroshio South of Japan

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In the region off the southern coast of Japan, the Kuroshio alternatively takes large-meander (LM) and non-large-meander (NLM) paths on interannual to decadal time scales. An LM path is greatly displaced southward associated with a large cyclonic eddy off the southern coast of Japan. Meanwhile, an NLM path flows near the coast. Further, there are two types of LM path in terms of the stability of the current path. An LM path formed in August 2004 and continued until July 2005 is an example of the stable type. The LM path was formed from a nearshore NLM path, which flows through the channel north of Miyake-jima Island. Meanwhile, another LM path occurred in September 2017 and continued at present is an example of the unstable type. The LM path changed from an offshore NLM path, which passes through the channel south of Hachijo-jima Island. In addition, the meandering trough of the LM was observed to be more shifted to the east and to be frequently located on the Izu-Ogasawara Ridge. To obtain the mechanisms of the two types of LM path, we performed a detailed comparison between the 2004-2005 and 2017-present LM paths using hydrographic, acoustic surface-bottom round-trip time, sea surface height (SSH), and bottom pressure (BP) data. While, associated with the formation of the stable type (2004-2005 LM), BP varies vigorously owing to the passage of a deep cyclonic eddy, BP before the formation of the unstable type (2017-present LM) is invariable. In this study, using bottom pressure data collected in the area east of Hyuga-nada, Kyushu, from March 2014 to April 2019, we examine the variation during the LM period.

Keywords: Kuroshio, Large meander, Sea surface height, Bottom pressure