An ocean-dynamic model for the periodic inflow of Tsushima Current in the early Holocene

*Atsuhiko Isobe[1]

1. Research Institute for Applied Mechanics, Kyushu University

In the early Holocene, the Tsushima Current was a periodic inflow into the Sea of Japan opened to the North Pacific, and thereafter became a steady throughflow after 8,000 years from the present (Oba et al., 1991, Oba, 2006). However, we met some resistance to accept this periodic-inflow idea from ocean dynamics, because the Tsushima Current has been recognized as a linear bypass flow which separates from the subtropical gyre (Minato & Kimura, 1980). Thus, the Tsushima Current could not be a periodic flow unless the subtropical gyre had fluctuated, or unless the Tsushima Strait was periodically opened and closed to the North Pacific. We here proposed an ocean dynamic model in which a periodic inflow generated from the steady subtropical gyre by using a non-linear model based on an island rule in Kida & Qiu (2013). We demonstrate that the volume transport of the Tsushima Current has two solutions which were alternatively revealed in line with the transition of the environment which might appear around the shallow Tsushima Strait in the early Holocene.

Keywords: Tsushima Current, periodic inflow, nonlinear model

