

The Pathways and Timescales of Indonesian Throughflow

*ISKANDAR MOCHAMAD RIZA¹, Toshio Suga¹, Kelvin John Richards², Hideharu Sasaki³

1. Graduate School of Sciences, Tohoku University, 2. International Pacific Research Center, University of Hawaii, 3. Application Laboratory, Japan Agency for Marine-Earth Science and Technology

The major of Indonesian Throughflow (ITF) pathways are divided into two main routes, they are the western and eastern pathways. The properties differences of ocean circulation from these two pathways were examined by using Lagrangian particles in the high-resolution ocean model. The daily and monthly data fields also applied in the Lagrangian framework to see the discrepancies of the flows and crossing time. The particles originating from Mindanao need less than ~3 months to reach Makassar Strait and the same time needed to leave this strait to the southern end of Makassar Strait. The particles mostly flow out to the Indian Ocean via Timor Passages, Ombai Strait and Lombok Strait and associated with the upper ocean pathways. The eastern path originated from the north and south equator. The particles leaving the Lifamatola Strait to reach the Banda Sea and coming from the inflow both have broad of crossing time from ~3 months to ~1 year. The eastern path is concentrated in the 500-1000m depth range. Timor passages show as the strongest currents in the outflow channel in the eastern path. The application of the monthly fields in the Lagrangian framework shows the larger number of particles crossing the threshold section associated with the Lagrangian transport and faster crossing time

Keywords: Indonesian Throughflow, Lagrangian framework, OFES2