

Amplitude modulations of seasonal variability in the Karimata Strait throughflow

Publons ID	(not set)
Wos ID	WOS:000921915900001
Doi	10.3389/fmars.2023.1085032
Title	Amplitude modulations of seasonal variability in the Karimata Strait throughflow
First Author	
Last Author	
Authors	Nie, YC; Li, SJ; Wei, ZX; Xu, TF; Pan, HD; Nie, XW; Zhu, YH; Susanto, RD; Agustiadi, T; Trenggono, M;
Publish Date	JAN 19 2023
Journal Name	FRONTIERS IN MARINE SCIENCE
Citation	
Abstract	<p>The Karimata Strait (KS) throughflow between the South China Sea (SCS) and Java Sea plays an essential role in heat and freshwater budget in the SCS and dual roles in strengthening/reducing the primary Indonesian throughflow (ITF) in the Makassar Strait. A sustained long-term monitoring of the ITF is logistically challenging and expensive; therefore, proxies are needed. Here, we use a combination of in situ measurement of the KS throughflow and satellite-derived sea surface height (SSH) and sea surface wind (SSW) to determine the interannual and decadal modulations in seasonal amplitude of the KS throughflow associated with El Nino-Southern Oscillation (ENSO), Indian Ocean dipole (IOD), Pacific Decadal Oscillation (PDO). Linear regression, correlation, harmonic and power spectrum analyses are used. The results manifest that there are significant interannual to decadal modulations in the seasonal amplitude of the KS throughflow. The modulations of the seasonal amplitude in the volume and heat transports range 1.36-1.92 Sv (1 Sv = 10(6) m(3) s(-1)) and 126.41-173.36 TW (1 TW = 10(12) W), respectively, with a significant cycle of similar to 9 years. From 1994 to 2020, the seasonal amplitude of volume transport through the KS shows an increasing trend of 37.75 +/- 15.69 mSv decade(-1) (1 mSv = 10(3) m(3) s(-1)). The seasonal amplitude of the heat transport also increases, at a rate of 4.78 +/- 1.52 TW decade(-1). The KS volume transport is positively correlated with PDO and ENSO indices ($r(2) = 0.69$ and $r(2) = 0.58$), with a lag of 12 and 10 months, respectively. The results of composite analysis suggest that the interannual variability of the KS transport is related to the interannual anomalies of the SSH gradient and the local SSW fields in boreal winter.</p>
Publish Type	Journal
Publish Year	2023
Page Begin	(not set)
Page End	(not set)
Issn	
Eissn	2296-7745
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000921915900001
Author	MUKTI TRENGGONO, S.Kel, M.Si