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Tidal front investigation in Malacca strait

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Two-dimensional hydrodynamics model which was built by Mellor et.al (1977) was applied in Malacca Strait to investigate the tidal front. The pattern of current circulation which generated by tide and wind and by tide only has the same pattern. In the other word, the current circulation in Malacca Strait mainly induced by tide. The mean velocity is 0.25 m/s. The value of $\log_{10}$ (H/U^3), where H is depth (m) and U is mean tidal velocity (m/s), is calculated to predict the tidal front position. The value of $\log_{10}$(H/U^3) < 3.0 was indicated as tidal front region.From the four major tidal constituents (M2, S2 N2 and K1) simulation, only M2 and S2 get the contour lines $\log_{10}$(H/U^3) < 3.0. These small log(H/U3) areas are well-mixed by tides which may induce high Chl-a concentrations. Five locations were indicated as location of tidal front namely Bagan Siap-Api, Belawan Deli and Rupat Island (in Indonesia region); and Teluk Anson and Klang (in Malaysia region). Compare with the SeaWIFS-derived Chl-a concentration 2003, the location as mention above have high Chl-a concentration through the year. Therefore the locations of contour lines $\log_{10}$ (H/U^3) $<$ 3.0 are in good agreement with the frontal positions.