Modeling China Sea Circulation

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East China Sea (ECS) and South China Sea (SCS), linked together by Taiwan Strait to form China Sea (CS), are shelf sea and semi-enclosed marginal sea separated from the Pacific ocean basin by shelf break and by Luzon Strait, respectively. Besides deep basins in the SCS, CS has broad shelves which generally cover a sea area between continental margin with water depth of about 200 m and the land shore. The circulation in the CS is mainly driven by the south-east Asia monsoonal winds and largely modulated by its exchanges with the western Pacific Ocean through the variation of western boundary current, Kuroshio. The circulation is governed by the topographically-guided geostrophic currents flowing along the continental margins. Intrinsic dynamics that arise mainly from the local flow-topography interaction shape and characterize the distinct temporal and spatial natures of the CS circulation. A three-dimensional high resolution (~ 10 km) CS circulation model has been developed to investigate the processes and dynamics for characteristic variations of the circulation in CS. Forced with climatologically averaged monthly and high frequency, inter-annual atmospheric fluxes and lateral fluxes from larger scale models, we validated model results with the satellite remote sensing data in long-term seasonal mean and inter-annual time domains, respectively. In this talk, we present our recent findings of the circulation variability in these two time domains. In particular, time-dependent three-dimensional variability and associated dynamics regarding to Kuroshio intensity, width and exchanges with SCS in Luzon Strait and with coastal waters in ECS will be studied.