

國立臺灣師範大學 103 學年度碩士班招生考試試題

科目：專業英文

適用系所：海洋環境科技研究所

注意：1.本試題共 2 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則不予計分。

請將下面三段摘自海洋科學期刊的英文翻譯為中文 (語意正確即可，不需要逐字翻譯。專有名詞可以不用翻譯，例如 "Guan" 可以翻譯為 "管" 或保持原英文字)。

1. Near the northwestern shelf region, there is an alleged South China Sea Warm Current (SCSWC) flowing against the prevailing northeast monsoon in winter. Earlier studies about the SCSWC were mainly based on hydrographic data. As the northeast monsoon wind prevails, the SCSWC was perceived as a strong, narrow band of northeastward current that persists all winter long. However, the monsoon wind gust may prevent it from surfacing from time to time. Its width is about 160~300 km, and the maximum surface current speed is estimated to be 0.3 m/s. According to Guan (1978), the SCSWC is mostly confined between 200 m and 400 m isobaths based on earlier inaccurate bathymetry charts. After 30 years of improvement in bathymetry data, we have double-checked his region of interest and updated the relevant isobaths bounding the SCSWC as 100 m and 300 m isobaths. The duration of the current is about 4~6 months and the along-shore extent is roughly from 111°E to 117°E according to Guan (1985). The current probably originates from the vicinity of the Hainan Island and reaches as far north as the southern part of the Taiwan Strait. The Dongsha Islands and surrounding reef may cause the SCSWC to bifurcate. The eastern branch flows steadily northeastward, while the western branch contains seasonal variations in the flow path, width, salinity and flow velocity (35 分).
2. On biweekly time scales surface-trapped current reversals often lead to Taiwan Strait transport reversals if the northeasterly wind bursts in winter are sufficiently strong. On seasonal time scales the northward current is the strongest in summer since both summer monsoon and pressure gradient force are northward. The summer northward current appears to be relatively unimpeded by the Changyun Rise (CYR) and bifurcates slightly near the surface. With the arrival of the northeast monsoon in fall, downwind movement of China Coastal Water (CCW) is blocked by the northward current near 25.5°N and 120°E. In winter, the northward current weakens even more as the northeasterly monsoon strengthens. The CCW moves downwind along the western boundary; the CYR blocks part of the CCW and forces a U-shaped flow pattern in the northern Strait. Past studies have failed to reveal an anticyclonic eddy that develops on the northern flank of CYR in winter. On interannual time scales a weakened northeast monsoon during El Niño reduces advection of the cold CCW from the north and enhances intrusion of warm water from the south, resulting in warming in the TS (30 分).

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3. The westward propagating eddies reach the western North Pacific where they interact with the Kuroshio, and may modulate the Kuroshio transport and path. In the present study, we focus on the fate of eddies as they interact with the Kuroshio east of the Luzon Strait. The Luzon Strait is a gap in the western boundary. The northward-flowing Kuroshio sometimes loops or intrudes into the South China Sea through the Luzon Strait before continuing northward along the east coast of Taiwan. The seasonal, intra-seasonal and interannual variability of the Kuroshio intrusion have been reported in various observations and model simulations. During the period 1989–2002 drifters were tracked to enter the South China Sea between October and December. Wu and Chiang (2007) also found that the westward intrusion (i.e. looping) of the Kuroshio through the Luzon Strait in December is more often than in August. In summer, the Kuroshio would tend to “leap” across the Luzon Strait without making a westward loop. The seasonal variability of Kuroshio looping or leaping (we follow Sheremet (2001) in using the terms “looping” and “leaping” to describe the two modes of Kuroshio in the Luzon Strait) is likely to depend on the strength of transport, which can in turn affects how eddies behave when they propagate near the Kuroshio(35 分).