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1 **Characteristics and seasonal variability of internal tides in** 2 **the southern South China Sea**

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7 Abstract

8 Two sets of current mooring records at the same location are used to investigate
9 the generation and temporal variation of internal tides (ITs) near reefs in the southern
10 South China Sea (SCS). The total records covered more than 900 days. ITs in this
11 region are dominated by mode-1 diurnal motions, which are mainly composed of O_1 ,
12 P_1 and K_1 constituents. The major axes of both diurnal barotropic and baroclinic tidal
13 ellipses are oriented in the northeast-southwest direction. The ITs over the entire
14 observation period clearly show an approximately 14-day spring-neap cycle.
15 Meanwhile, the diurnal ITs also displayed an evident seasonal change: their energy
16 was higher in summer and winter than in spring and autumn. The modal
17 decomposition of diurnal motion shows that their time-averaged kinetic energy in
18 summer and winter was about 1.2 KJ/m^2 , which was approximately 60% higher than
19 the values in spring and autumn. The same seasonal variation also occurred at the
20 diurnal barotropic tides with prominent O_1 , P_1 and K_1 constituents. Because
21 stratification does not show a significant seasonal variation in the southern SCS, the
22 enhanced diurnal ITs in winter and summer can be attributed to the barotropic forcing

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