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The improvements to the numerical model of South China Sea Ocean Circulations

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The South China Sea (SCS) ocean circulations numerical model has been build up based on ROMS with high horizontal resolution. It had been operated in NMEFC to provide daily updated the hydrodynamic forecasting in SCS for the future 5 days since 2013, and named as the SCS operational Oceanography Forecasting System (SCSOFS). Recently, a few systematic optimizations have been carried out to the configuration of the physical model to improve SCSOFS forecast skill. For example, the differential schemes of horizontal and vertical advection of tracers are changed from 4^{th}-order centered to 4^{th}-ordered Akima, the schemes of horizontal mixing of tracers are changed from along epineutral surfaces to along geopotential surfaces, in order to correct for the spurious diapycnal diffusion of the advection operator in terrain-following coordinates, which could cause anomaly temperature increasing about 1 centigrade in deep layer. The method of sea surface atmospheric forcing is changed from direct forcing to bulk formula, by introducing the negative feedback effects between ocean and atmosphere, in order to improve forecast skill of sea surface temperature.