



## **New insight on the opening of the South China Sea basin**

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The tectonic evolution of the South China Sea (SCS) plays an important role on the geodynamics of Southeast Asia. Recent results from the International Ocean Discovery Program (IODP) Expedition 349 confirmed that the SCS seafloor spreading stopped in the middle Miocene. However, the definite mechanism for the SCS opening is still enigmatic. Using multi-beam bathymetric data, seismic reflection profiles and geomagnetic modeling, we have analyzed the seafloor-spreading pattern and geomagnetic stripes of the SCS. Our results show that an excessive magma supply affecting the SCS occurred at the Early Miocene Climatic Optimum (EMCO). Consequently, four major tectonic events ensued. Firstly, the East Subbasin of the SCS dramatically changed its seafloor spreading direction from north-south to northwest-southeast. Secondly, a northeastward propagating rift occurred in the East Subbasin but stopped in the middle Miocene, just before the cessation of the SCS seafloor spreading. Thirdly, the opening of the SCS extended southwestward and created the Southwest Subbasin. Fourthly, the initiation of the southeastward subduction of the SCS lithosphere occurred and the Manila Trench was formed.