



## **Implications of IODP Expedition 349 Age Results for the Spreading History of the South China Sea**

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The International Ocean Discovery Program (IODP) Expedition 349 in the South China Sea drilled three sites (U1431, U1433, and U1434) into the basaltic crustal basement near the fossil spreading center in the East and Southwest Subbasins. These results provided age constraints on the termination of seafloor spreading in the South China Sea (SCS) basin. Shipboard biostratigraphic analysis of microfossils from the sediment immediately above or between flows in the basaltic basement indicates early Miocene ages: 16.7–17.6 Ma for Site U1431 in the East Subbasin, ~18–21 Ma for Site U1433 in the Southwest Subbasin. Since Expedition 349, Ar/Ar dating of basalt samples from these two sites have confirmed these ages in the east, and have provided an age of 17 Ma in the Southwest. The similarity in crustal age between sites suggests that the last stages of spreading have been coeval in both the East and Southwest Subbasins, forming a single mid-ocean ridge system with a series of transform faults and discontinuities between the two subbasins. Expedition 349 also drilled Site U1435 on a bathymetric high along the northwestern continent-ocean boundary. Onboard core description, biostratigraphy and magnetostratigraphy revealed that sediment at this site shows a sharp discontinuity at about 33 Ma, interpreted to represent the breakup unconformity and date the beginning of seafloor spreading in the East Subbasin. The results of IODP Exp. 349, as well as results from deep-towed magnetic surveys, thus imply that oceanic seafloor spreading in the SCS, from 33 to ~16–18 Ma, is coeval with a large part of the left-lateral motion along the Ailao Shan-Red River Fault Zone (dated 34 to 17 Ma). This episode of the extension of the South China Sea basin is therefore more likely driven by the extrusion of the Indochina tectonic block resulting from the collision of India with Eurasia than by the subduction of a proto-South China Sea to the south.