Tectonics of the South China Block

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The South China block (SCB) appeared in the Neoproterozoic (ca 900 Ma) by welding of the Yangtze and Cathaysia Archean-Paleoproterozoic cratons. The resulting Jiangnan belt is a collision orogen characterized by ophiolites, serpentinite melanges, and high-pressure metamorphisic rocks. This belt was unconformably covered by thick terrigenous deposits at the end the Proterozoic.

During the Early Paleozoic, the SCB experienced two orogenic events. The main one is responsible for the Silurian welding of the SCB with the North China block along the Qinling belt, accommodated by northward subduction. The second event was an Ordovician intracontinental orogeny characterized by a north-directed continental subduction with a synmetamorphic ductile decollement layer, and crustal melting. The geodynamic origin of this intracontinental orogen remains enigmatic.

The southwestern boundary of the SCB with Indochina is also a controversial topic. Among the disputed issues are i) the location of the ophiolitic suture, ii) the age of the ophiolite (i.e. the age of the collision), iii) the collision mechanisms (i. e. the sense of subduction, crust-scale deformation mechanisms). The Red River fault is not an ophiolitic suture, but a Cenozoic intracontinental strike slip fault that accommodates the extrusion of Sundaland during the Indian collision. Similarly, our observations do not support the existence of the « Babu ophiolites » in Yunnan and Guangxi provinces, since these mafic rocks are coeval with the intraplate Emeishan basalts. Furthermore, two NW-SE striking orogenic belts, namely the Song Ma and the Song Chay belts, are developed in NW and NE Vietnam, respectively. The architecture of each belt consists in a stack of NE-directed nappes formed in ductile, synmetamorphic conditions in the southwestern part, and in more superficial ones in the northeastern part. The Late Triassic unconformity, 235-210 Ma postorogenic plutonism, and 250-240 Ma syntectonic metamorphism support an Early to Middle Triassic age for these tectonic events. The Song Ma and Song Chay belts are both due to SW-directed subduction and continental collision. Two coeval S-dipping subduction zones might explain the geodynamic framework of the belts. Instead, a single convergent system, offset by the Tertiary Red River fault, is preferred, as it better accounts for the location of the Late Permian intraplate magmatism. Triassic deformations are widespread in the entire SCB. Along the northern margin, the Early Paleozoic belt is reworked by an intracontinental orogeny along the Sulu-Dabie-Wudang belt. In the Central part of the SCB, in Hunan province, the Xuefengshan belt is also an intracontinental belt accommodated by northwestward shearing.

The Jurassic and Cretaceous half-grabens filled by continental red beds, and the synkinematic plutons bounded by normal or strike-slip ductile fault are widespread in the SCB. Nevertheless, a comprehensive picture of the Late Mesozoic geodynamic evolution of the SCB remains a research topic for forthcoming years.