



## **Late Permian to Late Triassic basin evolution of North Vietnam: geodynamic implications for the South China and Indochina blocks**

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The core of South East Asia is composed of a mosaic of continental blocks, among which the Indochina and the South China blocks (present day northern Vietnam), amalgamated during the Permian and/or the Triassic. Late Permian to Late Triassic geodynamic evolution of these two blocks remains controversial. The main discussion points concern the existence and the closure of an oceanic domain separating the Indochina and the South China blocks during this period. Especially, the polarity and the timing of the subduction zone that led to the collision between the blocks as well as the present location of the suture delimiting them are a matter of debate. Despite the valuable information they can provide, the sedimentary basins from northern Vietnam have been neglected in the previous studies dealing with the geodynamic evolution of South East Asia.

To determine the geodynamic evolution of the area, the basins of Sam Nua and Song Da, presently located in North Vietnam, have been investigated using a combined approach involving sedimentology, geochronology (U-Pb/zircon) and geochemistry (whole-rock major and trace elements composition of both volcanic and volcanoclastic rocks). The palaeoenvironment evolution, the main unconformities, their age and the tectonic affinities of the interbedded volcanic and volcanoclastics series have been characterized for these two basins. Our results demonstrate (i) that the Song Da Basin exhibits a palaeogeographic affinity with the South China block, (ii) the occurrence of extensive calc-alkaline volcanism and associated volcanoclastic deposits in the Sam Nua Basin, related to the existence of an active magmatic arc during the Early and the lower Middle Triassic, (iii) a South dipping (present day coordinate) oceanic lithosphere beneath the Indochina block, deduced from the location of the magmatic arc south of the potential suture zones, (iv) that an angular unconformity postdates the lower Middle Triassic volcanoclastic deposits in the Sam Nua basin. This unconformity, crosscutting the subduction related deposits, is interpreted as the result of the collision between the Indochina and the South China blocks.