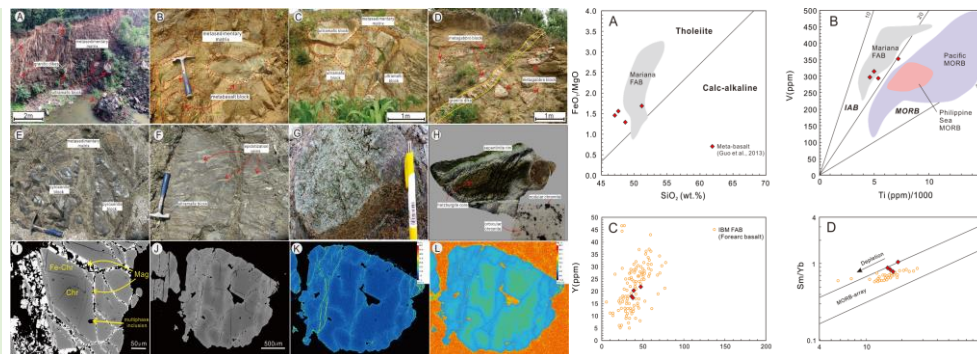
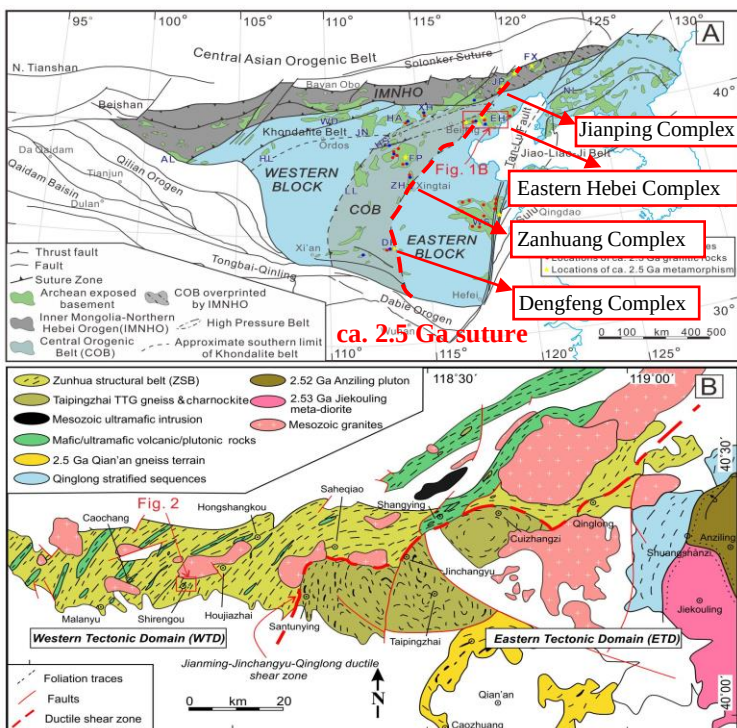


Life cycle of an Archean subduction zone from initiation to arc–polarity reversal: Insights from the Zunhua ophiolitic mélange, North China Craton

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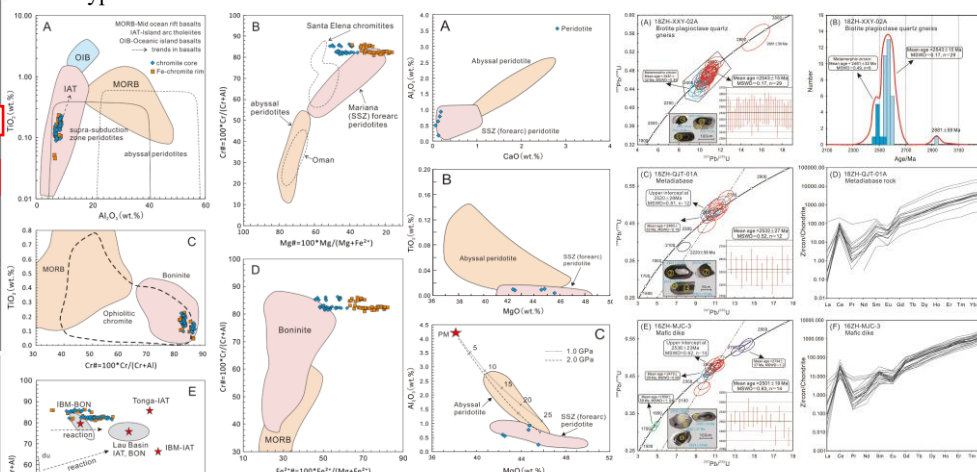
Introduction

Documentation of a Neoarchean Zunhua ophiolitic mélange (ZOM) in the Eastern Hebei Complex, a tectonic mélange in the Jianping, Zanzhuang and Dengfeng Complex of the North China Craton (NCC) defines an Archean suture zone (ca. 1600 km), which delineated the boundary between the Eastern Block and the Central Orogenic Belt of the NCC. However, the subduction initiation process, age, and longevity are poorly understood.



Typical “block-in-matrix” fabric in the ZOM

Fore-arc basalt blocks within the ZOM



Chromites in dunite blocks of the ZOM produced by rock-melts reaction between harzburgite and boninitic melts, which considered to occurred during subduction initiation.

Metamorphosed intermediate–mafic volcanic blocks exhibit systematic successive geochemical variations, from MORB-like to volcanic arc-like, and the N-MORB-like meta-basalts show remarkable similarity with the subduction initiation-related Izu–Bonin–Mariana (IBM) fore-arc basalts.

Conclusions and implications

A life cycle of an Archean subduction zone, including birth (subduction initiation), maturity (arc magmatism), death (arc-continent collision) and re-birth (arc–polarity reversal), is recorded in the Zunhua ophiolitic mélange, and the geodynamics of plate tectonics at the Neoarchean was similar to that of today.

