A series of Ni-Cu sulfide deposits hosted in Early Permian mafic-ultramafic complexes occur along the ~500 km long linear Huangshan-Jingerquan belt in the East Tianshan at the southern margin of the Central Asian Orogenic Belt (Fig. 1) (Zhou et al., 2004; Song and Li, 2009; Song et al., 2011; Qin et al., 2011; Deng et al., 2014). Questions for genetic link between these deposits and the Early Permian Tarim mantle plume are: (1) Early Permian Ni-Cu sulfide mineralized mafic-ultramafic complexes have been also found in locations 1500-2000 km to the east along the southern margin of the Central Asian Orogenic Belt and (2) Similar Silurian and Devonian complexes also occur in adjacent West Tianshan and Beishan Belt.

Absence of Late Carboniferous and Permian strata, along with Early Permian retrogression (269 Ma) of blueschist and eclogite along the Aqikkudusksuture indicate that the continental collision occurred during the Late Carboniferous to Early Permian. This permits us to propose that Ni-Cu sulfide mineralized the mafic-ultramafic complexes were formed in a syn-collisional environment. Collision between the Kanggur-Yamansu arc and the Central Tianshan micro-continent resulted in slab detachment melting of uprising asthenosphere and adjacent metasomatized mantle. This process induced unusual partial melting of the mantle along the Huangshan-JingerquanBelt in a short time (Song et al., 2013). P-T
estimations of the eclogite and blueschist along the Aqikkuduk suture suggest that the subducted oceanic slab reached a depth of $\geq 30$ km. We propose that shallow slab detachment induced decompression melting of uprising asthenosphere and generation of the tholeiitic magmas at depths less than 50 km along the Huangshan-Jingerquan Belt. The tholeiitic magmas mixed with melts derived from overlying metasomatized mantle wedge and crustal material that were heated by the upraised hot asthenosphere.

References