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**The geological significance of the rediscovered fuchsite quartzite with abundant Eoarchean detrital zircons in eastern Hebei Province, China**



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A new fuchsite quartzite block was discovered in Lulong in the east of the Hebei Province. The fuchsite quartzite, structurally contacting with various rocks including metamorphic gabbro, feldspar biotite schist and feldspar quartzite, all together constitute massive lenses enclosed in monzonitic granite that intruded into the Archaean basement. The occurrence of the complex was just below the unconformity between the Proterozoic Changcheng Group and Archaean basement, which is quite similar to the fuchsite quartzite discovered in the adjacent Caozhuang area[1-3] about 40km to the west Lulong. The detrital zircons in fuchsite quartzite of Lulong area are light brown, rounded with typical detrital zircon features, demonstrating prominent characteristics of long-distance transportation. Most of the zircon grains were of magmatic origin with oscillation internal belts and high Th/U values, implying a provenance of granitic rocks. The U-Pb ages of the detrital zircon scattered in the range of 3200~3200 Ma, which constrain the maximum deposition age of the fuchsite quartzite should be less than 3200 Ma. The maximum age of single zircon was 3960 Ma, which implies the possible existence of >3900 Ma detrital supracrust in the eastern Hebei Province. The age distribution of the detrital zircons is similar to that of the fuchsite quartzite in Caozhuang Group in Caozhuang, Qianan. Considering this similarity of the detrital zircon of fuchsite quartzite from the two different sites, it could be inferred that this kind of fuchsite quartzite with Eoarchean detrital zircons might have a wider distribution in eastern Hebei Province than thought before. In previous studies, the wall rocks of the fuchsite quartzite in the two different regions were assumed belong to two separate structural units: Qianxi Group and Luanxian Group. However, the new data in this paper indicate these two complex groups have similar detrital zircon age spectra, which suggests the two groups might locate in the same stratigraphic horizon of the same structural background. Based on the zircon chronological data of fuchsite quartzite from both Caozhuang and Lulong, their provenance could be from one giant ancient terrane with abundant 3200~3800 Ma rocks. The closest Archean terrane is in Anshan, which composed of multiple granitic magmatism in 3600-3800 Ma. But so far, there is no robust evidence supporting Anshan Terrane was the provenance of Lulong and Caozhuang fuchsite quartzite. In previous work, Qinglong – Luanxian was considered as the Paleoproterozoic suture zone between eastern Hebei Province's ancient continental nucleus and Qinhuangdao – Suizhong ancient magmatic arc. But if Lulong and Caozhuang belonged to the same landmass in Neo-Archean, the Qinhuangdao – Suizhong magmatic arc and eastern Hebei Province's ancient continental nucleus could be welded together in Neo-Archean. The chronological study on fuchsite quartzite in Lulong provided more information to improve our understanding the Archaean geological evolution of eastern Hebei province.

*References:*

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