FE-RICH SPHERULES BEARING ANGULAR QUARTZES OF TAIHU LAKE: POSSIBLE FALLOUT OF EJECT PLUMES. Zhidong Xie, Shuhao Zuo, Henian Wang. School of Earth Sciences and Engineering, Nanjing University, P. R. China, zhidongx@nju.edu.cn.

We propose that the Fe-rich spherules of Taihu lake are fall-out of eject plumes of airburst event in ~ 7500 years ago. Impact origin of Taihu lake basin was proposed on the basis of circular shape and deformed features of quartz grains [1, 2]. The impact hypothesis was revived based on discovery of unique Fe-rich concretions [3]. However, direct contact impact is difficult to explain such big, shallow, flat, young lake; airburst could produce a huge flat Holocene basin without major basement disruption [4]. Here we report the mineralogy of the Fe-rich spherules, and discuss how they formed.

Fe-rich spherules are basic unit of all Fe-rich concretions (spherule, rod and causal shaped), widely dispersed in a specific mud layer dated as ~7500 BP, in bottom of Taihu lake, Southeastern of China. The size of spherules can range form μm to mm, even up to cm. Most spherules are bean-sized (show in upper picture). Some bean sized spherules are hollow. The Fe-rich spherules consist of angular quartz grains as major debris, and rock fragments as minor debris, and fine clay, siderite, and unknown Fe-rich materials as the matrix observed under microscopy.

Two models are proposed to form the Fe-rich spherules: one is precipitation of fine matrix around angular quartz fragments in the mud layer, another one is aggregation of shattered angular quartz fragments and fine materials in an eject plume involving a base surge by an airburst. The spherules widely dispersed in the specific Holocene layer of Taihu lake indicate a young event. Lapilli-like spherules indicate a high-energy environment, such as chaotic dynamic vapor or flood current. Angular quartzes with sharp edges with different sizes indicate that they were fragments mechanically shattered, not products of long transportation, such as lake sediments, which prefer the second model, the airburst plume model. It is still in black box for the detail airburst and siderite formation. Many questions are widely open.

References: [1] Y. He, D. Xu, D. Lu et al., 1990. *Chinese Science Bulletin*, 36 (10): 847-850. (in Chinese). [2] E. Wang, Y. Wan, Y. Shi, et al. 1993. *Chinese Science Bulletin*, 39 (5): 149-423 (in Chinese). [3] H. Wang, Z. Xie, and H. Qian, 2009. *Geological Journal of China Universities*: 15: 437-444. (in Chinese). [4]Y. Dong, Z. Xie, S. Zuo, 2012. *Geological Journal of China Universities*: 18: 395-403. (in Chinese).