Mercury accumulation in salt marsh ecosystem of Yangtze estuary

X. ZHENG, L. ZHOU AND J. ZHAO

Key laboratory of Geo-information Science of Ministry of Education, East China Normal University, Shanghai, China, 200062

Salt marsh belongs to some of the most productive natural ecosystems of the world. The salt marsh ecosystem of Yangtze estuary is the important food supplier of the fish and bird, including the migratory bird in East Asia. Due to the industrialization along the shore of the estuary, huge amount of pollutant are emitted into this region. Large part of them is sinking, cycling in the estuary and accumulating in the salt marsh ecosystem. Mercury is the one of the most harmful heavy metal in environment due to its high mobility, biomagnification capacity. While until recent there are few researches on the mercury in Yangtze estuary. In this work we investigate the mercury accumulation in the typical salt marsh of Yangtze estuary.

The research site lies in the Chongmin Dongtan national nature reserve. The mercury concentration in atmospheric wet deposit, in water over the sediment, in the surface sediment, in the sediment in rhizophere of the vegetations, including three species of vegetations (two native species and one invasion species), in four types of large zoobenthoses have been investigated.

The results shows: 1) the mercury concentration in the wet deposit is a few times larger than in the water over the sediment, which implicated that the wet deposit could be a very important mercury input source in Yangtze estuary; 2) mercury concentration in the sediment of rhizophere is larger than in the surface sediment; 3) for salt marsh vegetation the mercury concentration in leaf is larger than that in stem and in stem larger than in root, which implicate that some part of the mercury accumulates to the ecosystem in Yangtze estuary is through the leaf respiratory; 4) the concentration in the invasion species is lower than the native species, which is different from the behavior of the other heavy metal elements, which demonstrates higher concentration in the invasion species than native ones; 5) the mercury concentration in animals general shows two times larger than the surface sediment, especial helice tridens tientisinesis accumulating magnificent mercury.

^{3}He distribution on the moon

YONGCHUN ZHENG[1], ZIYUAN OUYANG[1] AND D.T. BLEWETT[2]

[1]National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China (zyc@bao.ac.cn)

[2]Hawai'i Institute of Geophysics and Planetology, University of Hawaii, 2525 Correa Road, Honolulu, Hawaii 96822, USA

The distributions of the TiO_2 concentration and the regolith maturity Is/FeO are derived from the Clementine multi-spectral lunar digital image model (DIM) of the Moon in five spectral ranges (415, 750, 900, 950, 1000 nm wavelengths) [1, 2].

Abundance of ^{3}He in the lunar regolith at a given location depends on surface maturity, and titanium content, because ilmenite ($FeTiO_3$) retains helium much better than other major lunar minerals [3]. The abundance of ^{3}He in the lunar regolith is determined by:

$$^{3}\text{He (ppb)} = 0.2043\ [(\text{Is/FeO}) \times TiO_2]^{0.645}$$

We have developed a map of ^{3}He abundance of the Moon (Fig. 1) based on a combination of TiO_2 content and Is/FeO index. The highest ^{3}He abundances occur in the farside maria (due to greater solar wind fluence received) and in higher TiO_2 nearside mare regions. The highest concentration of ^{3}He is observed in the western regions of Mare Tranquillitatis. For the Earth should shields the Moon's near side from the solar wind for a portion of each solar orbit, solar wind-implanted particles are more abundant on the far side.

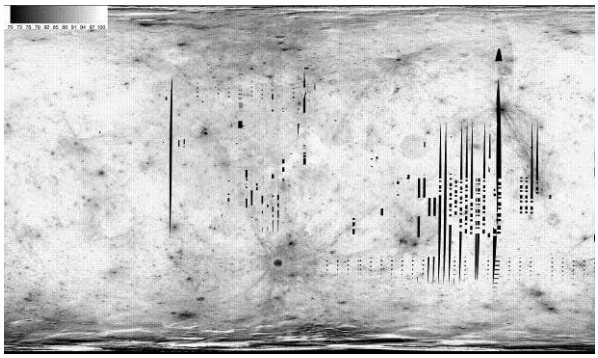

Figure 1: Map of ^{3}He abundance on the Moon.

[1] Lucey *et al.* (2000) *JGR* **105**(E8) 297-305. [2] Pieters *et al.* (2006) *Icarus* **184**, 83-101. [3] Taylor (1993) Proc. 2nd Symp. ^{3}He & Fusion Power. 49-56.