

Glaciochemical evidence of a transitional site of atmospheric circulation in East Antarctica

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Chinese Antarctic Research Expedition has since 1996 conducted several inland traverses from Zhongshan Station toward Dome Argus in interior East Antarctica. Our glaciochemical research suggests a transitional site of atmospheric circulation (76°32.5'S, 77°1.5'E, 2800m. a. s. l., designated at DT263) exists on the glacial investigation traverse along the route of the third Chinese Antarctic Inland Expedition. The spatial distribution of chemical compositions indicates the area closer to the coast is influenced by the proximal short-distance sea marine mass. In the inland area, materials in atmosphere are mainly from the long-distance transported high latitude atmosphere [1]. The distribution is attributed to local features (topography, wind speed *et al.*) in either inland area or coastal area. For the whole profile, it reveals the general influence of distance from sea and elevation. An 82.5m ice core was drilled at the transitional site which provides especially strong evidence of a LIA (Little Ice Age) type neoglaciation episode approximately from 1450 to 1850 [2, 3]. LIA has been found to be a common neoglaciation episode in numerous Northern Hemisphere locations and in a few places in the Southern Hemisphere. Compared with ice cores in other Antarctic areas, this information recorded at DT263 is more obvious, indicating special regional information about climate and environment variation and the regional differences in Antarctic climate variation. The temporal distribution here suggests evident regional characteristics. Associating with the spatial distribution of chemical compositions, we suggest the interaction of both oceanic climate and continental climate is the main factor in constituting the typical regional characteristics of the area approximating the transitional site.

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[1] Zhou *et al.* (2006) *GCA* **70**(18), S, A751. [2] Zhou *et al.* (2006) *Chinese Sci. Bull.* **51**(22), 2771–2780. [3] Li *et al.* (2009) *J. Geophys. Res.* **114**, D08117.

Study on the pollutant transport in unsaturated sand using CT

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In order to study the landfill leakage in unsaturated sand above groundwater level, the computerized tomography (CT) is applied to obtain CT images at different depth of the stable unsaturated zone in silica sand and yamazuna sand, the CT images are transformed into mean CT values by J-Image software, saturation is measured, the heights of capillary rise are 23.5cm and 38.0cm separately, the relationship is established between the saturation and the mean CT value. Then the pollutant potassium iodide (KI) solution is injected by continuous interval method with the rate of 0.69g/s, which the density is 1.1g/cm³ and the pore size of injector is 0.1mm with the constant head pressure. After scanning at different depth and time interval, the results of KI pollutant transportation are shown as Figure 1.

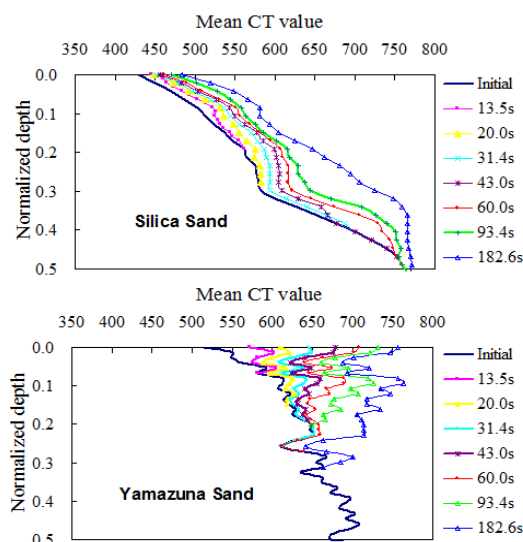


Figure 1 Mean CT value of unsaturated sand and with depth

The pollutant plume in silica sand at low saturation is obviously smaller than that of yamazuna sand. As the saturation increases, the pollutant plume expands and CT value increases gradually as well. But after reaching a certain depth, with the increase of saturation, the pollutant is diluted and diffused gradually, the sensitivity of CT value decreases gradually.