Validation of saltation flux parameterization with observation

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Introduction

The estimation of natural dust emission amount is important to understand the effects of dust on climate. Many dust emission parameterizations have been developed and it is required to investigate emission parameterizations and validate them with observation data.

Results and Discussion

In this study, the saltation flux formulation given by White [1] is used and it is as follows:

$$Q=C\times\rho_a/g\times u_*^3\times(1-u_{*t}/u_*)\times(1+(u_{*t}/u_*)^2)$$

where C is coefficient, ρ_a and g are air density and gravity, respectively, and u_* is friction velocity, u_{*t} is threshold friction velocity. The White equation [1] is compared with observation data collected during the Japanese Australian Dust Experiment (JADE) [2]. The coefficient C is obtained by the iterative method to make the difference between observed and calculated fluxes minimize. Figure 1 shows the comparison of calculated flux using new linear coefficient with observation data. The result indicates that the saltation flux equation has a good ability to predict sand flux with tuning the linear coefficient only.

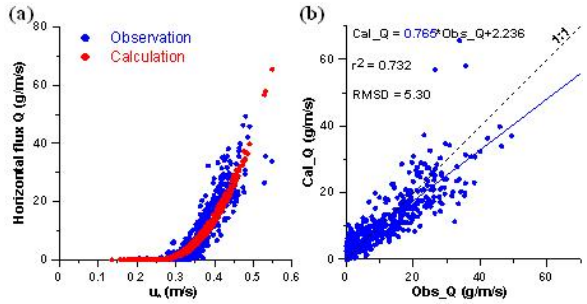

Figure 1: (a) Observed and calculated Q with friction velocity, (b)Scatter plot of observed Q versus calculated Q.

[1] White (1979) *J. Geophys. Res* **84**, 4643–4651. [2] Ishizuka *et al.* (2008) *J. Geophys. Res* **113**, D24212.

Geochronology and geochemistry of Hongqilapu granite in eastern Pamirs, China

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Hongqilapu granite is distributed in the boundary of China and Pakistan, composed o f granodiorite and quartz dioite which developing dioritic enclave. The granite belongs to the sub-aluminum to peraluminous and calc-alkali series, and is characterized by rich in Al, Fe, Ca, and LILEs (Rb, Ba, Th), poor in Hf, Zr, Y, Yb. In particular, partial rock have the geochemistry character of adakite, such as SiO_2= $60.41\times10^2\sim72.02\times10^2$, $A1_2O_3$=$15.53\times10^2\sim16.13\times10^2$, MgO=0.66 $\times10^{-2}\sim2.56\times10^6$, Y=$9.61\times10^6\sim18\times10^6$, Yb=$0.8\times10^6\sim1.44\times10^6$, Sr=$393\times10^6\sim560\times10^-$, riching LREE, HFSEs' (Ti, Nb, Ta)content is as much as, Eu have negative anomaly faintly. In addition, these rocks' K_2O/Na_2O>1 and Sr-Y×10-Zr diagram show that them belong to C-form adakite with high kalium, proving that Hongqilapu granite is the production of thickened lower crust partial melting. LA-ICP-MS zircon U-Pb dating of the granite indicate that the weighted mean $^{206}Pb/^{238}U$ age are 107.20±0.76Ma (n=29, MSWD=1.09), which belongs to Early Cretaceous Epoch. In conclusion, these information show Bangonghu-Nujiang ocean basin of Neotethys had closed earlier than lower cretaceous, which provide a new valuable information on the time limit of colliding between Gangdise block and Qiangtang massif.