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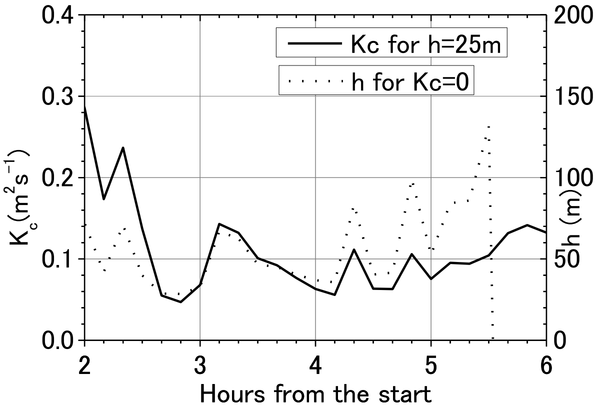
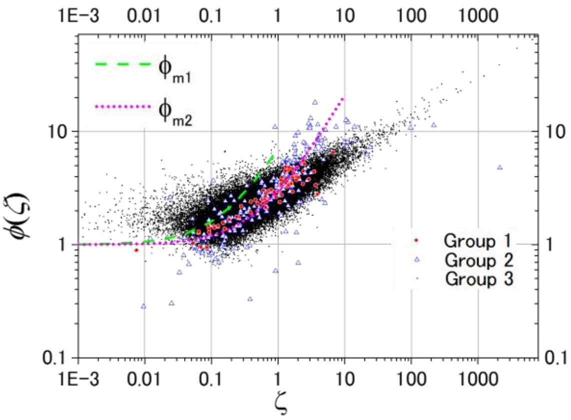
http://dx.doi.org/10.2151/jmsj.2014-106



← Figure 1. Time variation of K_C when the height of the layer is time-invariant in Period I. The estimated h is also shown for K_C = 0 at each time.



↓Figure 2. Relationship between $\phi(\varsigma)$ and ς and their scatter for groups 1, 2, and 3. The broken line (ϕ_{m1}) shows $\phi(\varsigma)=1+6\varsigma$ for $0<\varsigma\leq 1$ (Högström 1988) and the dotted line (ϕ_{m2}) shows $\phi(\varsigma)=1+2\varsigma$

- The time variations of estimated vertical diffusivity for radon (K_C) are shown in Fig.1, where assumed boundary layer height h = 25 m. As a reference, h for K_C = 0 at each time is also shown in Fig. 1. K_C and h are related in a quadratic equation for h.
- The relationship of $\phi(\varsigma)\propto\varsigma^{1/3}$ may be seen under a particularly strong stable condition because the term of friction velocity u_* is included both in $\phi(\varsigma)$ and in ς (self-correlation or spurious correlation). Figure 2 shows the relationship between $\phi(\varsigma)$ and ς for the three groups of the data; ensemble averaged time series datasets grouping on time variation of radon concentration used in the present analysis (group 1), original 10-min averaged data (group 2), and randomly disordered dataset (group 3).
- Figure 2 demonstrates that the scatter of group 1 is rather small, that of group 2 is very large, and the scatter of $\phi(\varsigma)$ in group 3 is correlated to $\varsigma^{1/3}$ for a large value of ς with large scatter. The proposed formula of $\phi(\varsigma)$ by Högström (1988) ($\phi(\varsigma)=1+6\varsigma$) and another formula which suits the result of group 1 ($\phi(\varsigma)=1+2\varsigma$) are added in Fig. 2 as a reference.