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Interactive comment on “Particle-reactive radionuclides (^{234}Th , ^{210}Pb , ^{210}Po) as tracers for the estimation of export production in the South China Sea” by C.-L. Wei et al.

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We appreciate the thoughtful review and constructive comments. The revisions in response to the comments are summarized below.

â€” Suggested by the reviewer, we have added a short description of the analytical procedures for the determination of ^{234}Th , ^{210}Pb , and ^{210}Po in seawater and trap samples. â€” Cai et al. (2008) was added in the discussion of the effect of physical transport on ^{234}Th budget in the upper water column. â€” Two papers by Cai et al. published in 2002 were cited for the eddy diffusion coefficient. â€” A sentence was added to explain why the trapping efficiency based on $^{210}\text{Po}/^{210}\text{Pb}$ disequilibrium is

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>1. If ^{210}Po is regenerated from particle remineralization, a lower estimated ^{210}Po based on the disequilibrium would be expected and, hence, results in a higher ratio of measured flux and modeled flux. We have toned down the representativeness of our estimate of the export production in the South China Sea. The export productions determined from other regions in the South China Sea were added into Table 4. These results were compared in section 4.4. Please see attached table. We agree that the errors associated with all measured and calculated parameters should be presented in the figures and tables. Regarding this issue, we have made following revisions: -Error bars showing the uncertainties estimated from the counting statistics are added to depth profiles of ^{234}Th (Fig. 2), ^{210}Pb (Fig. 3), and ^{210}Po (Fig. 4). Please see attached figures. -Error bars based on propagated counting errors were also added to the depth profiles of parent-daughter ratios (Fig. 6) and temporal values of the export fluxes (Fig. 8). Please see attached figures. -The standard deviations of all flux parameters are already listed in Table 1. -Uncertainties of removal fluxes of the three radionuclides were given in Table 2. Please see the attached table. -However, we feel that the table would be cluttered if uncertainties of the inventories and deficiencies of all radionuclides were listed, so no uncertainty of inventories and deficiencies is given. -We also feel that the standard deviations of trapping efficiencies based on the 6 samples listed in Table 3 are better than listing all uncertainties associated with individual trapping efficiency. -Average and standard deviation of various fluxes from this study are added in Table 4.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/8/C4136/2011/bgd-8-C4136-2011-supplement.pdf>

Interactive comment on Biogeosciences Discuss., 8, 9671, 2011.

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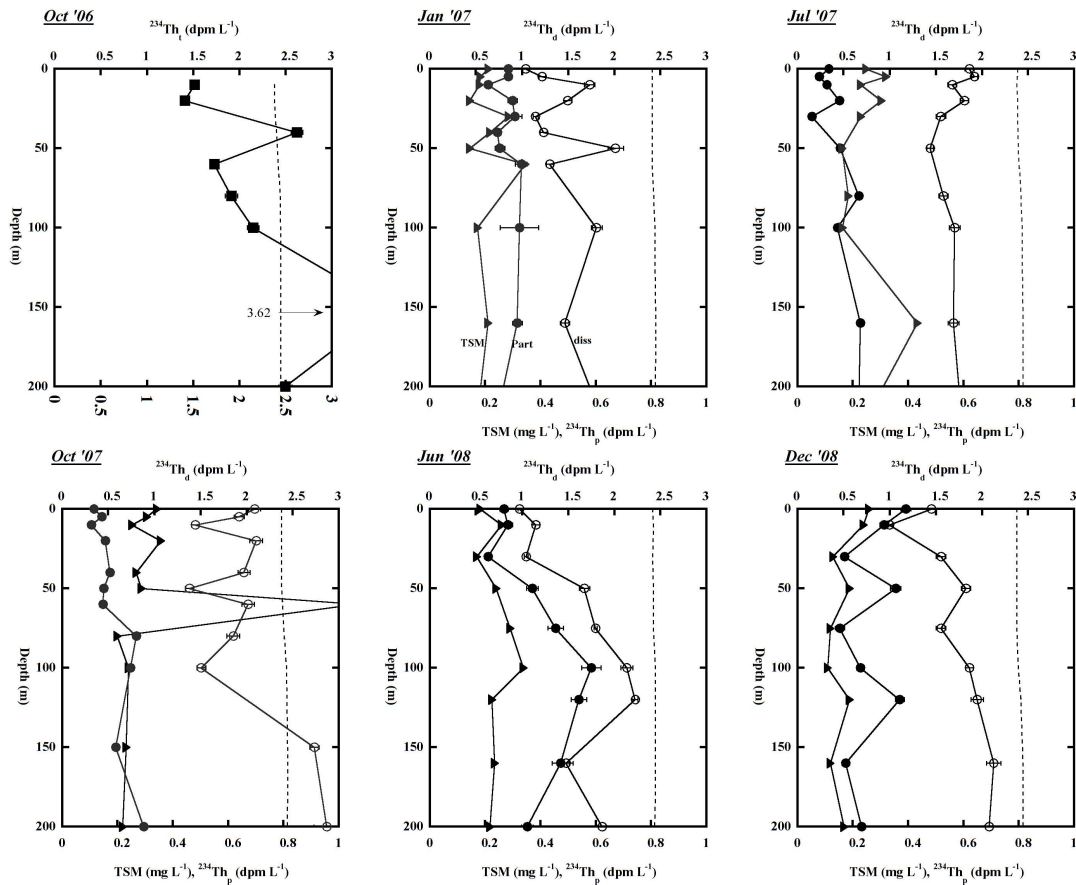


Fig. 1.

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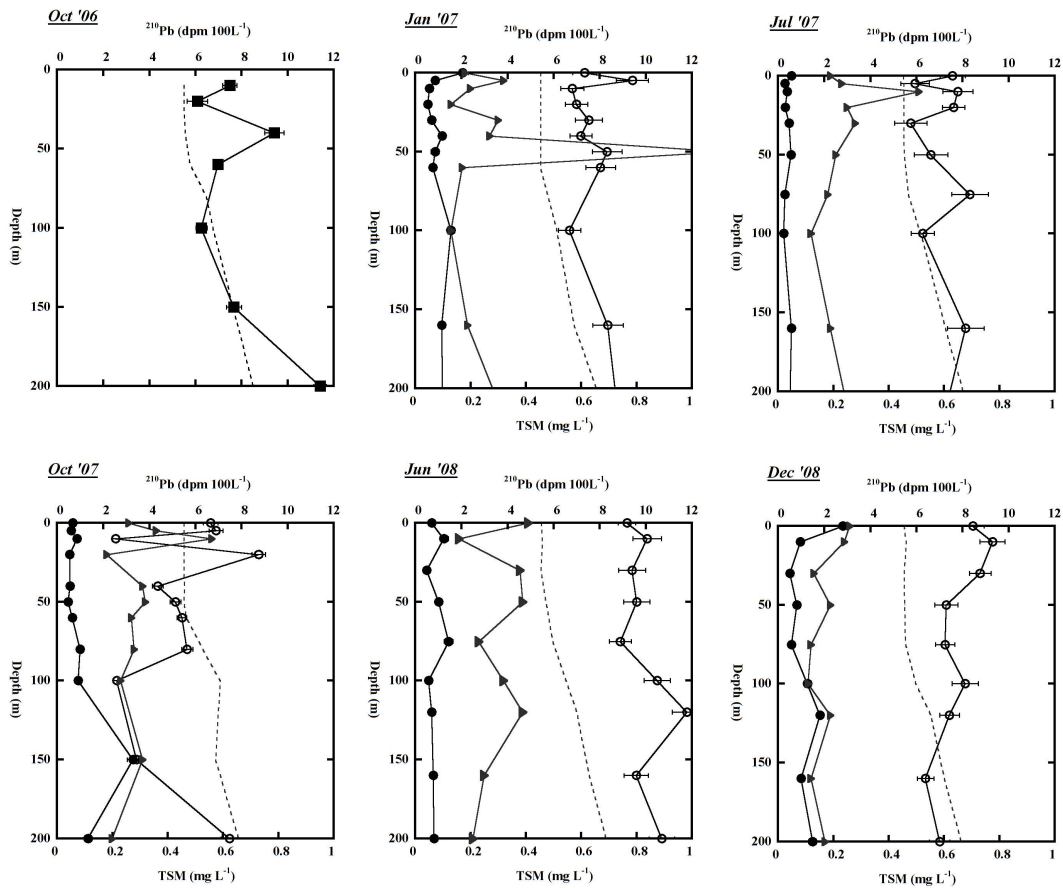


Fig. 2.

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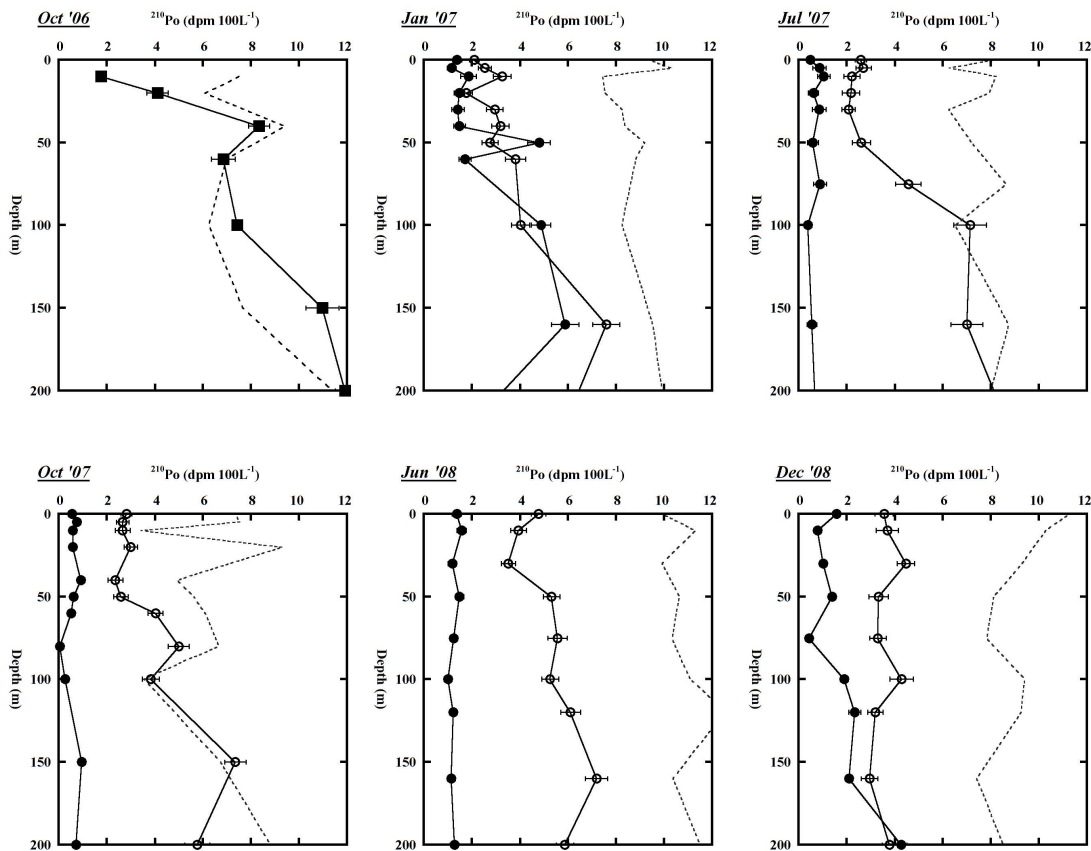


Fig. 3.

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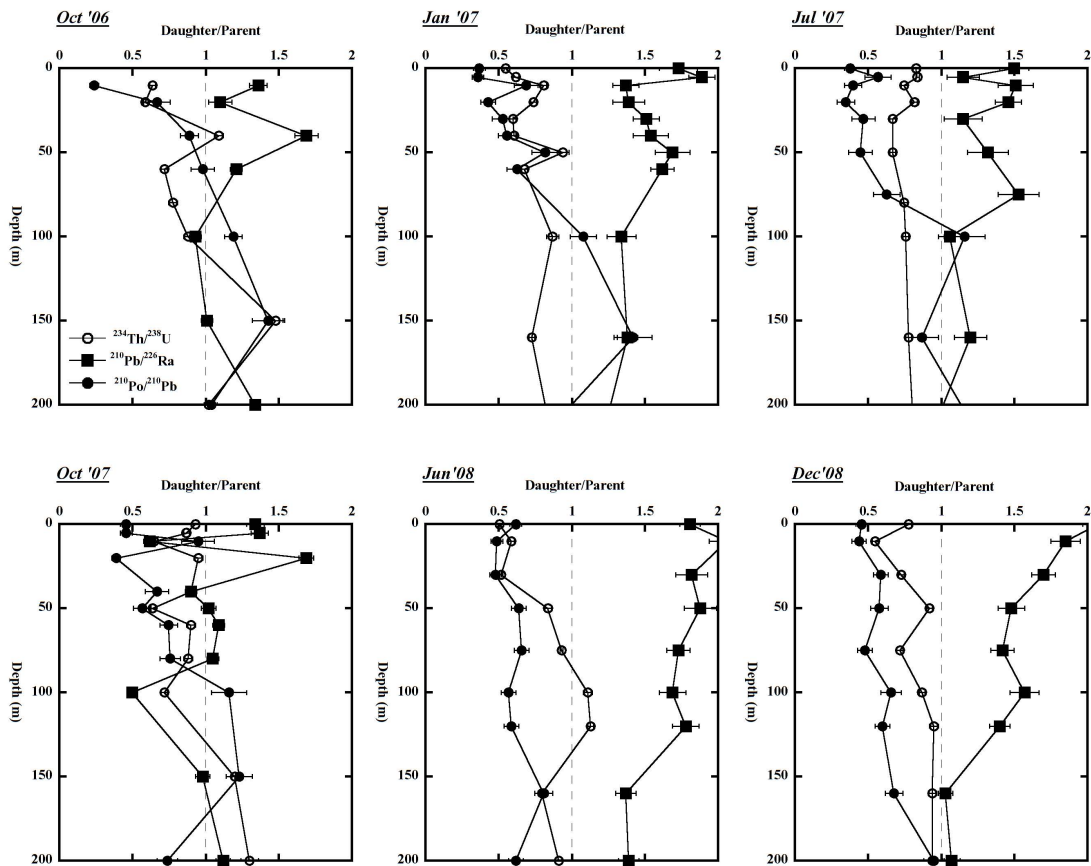


Fig. 4.

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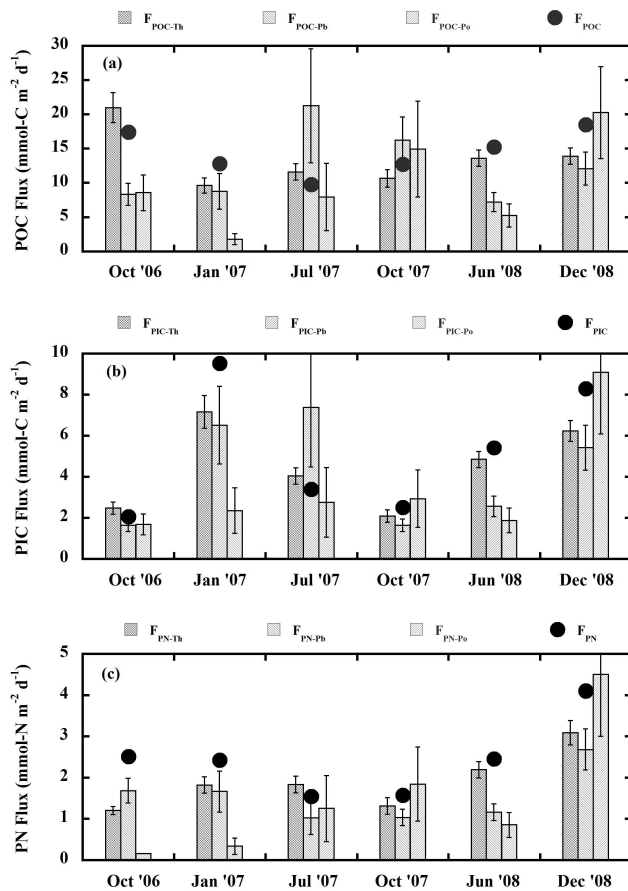


Fig. 5.