

## ***Interactive comment on “Global database of surface ocean particulate organic carbon export fluxes diagnosed from the $^{234}\text{Th}$ technique” by F. A. C. Le Moigne et al.***

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Received and published: 14 June 2013

This is a useful global compilation of POC fluxes derived from Th-234 deficits. The compilation is quite complete, but there may be a bit of an “apples and oranges” comparison in that different integration depths for the Th-234 deficit and different size fractions for the POC/Th-234 ratio are used in different studies. The authors should add these details to the tabulations (e.g. Table 2) so that readers can see how comparable are the approaches to the different published estimates of Th-derived POC flux. An additional complication is that POC/Th-234 ratios on different particle size fractions may be the best estimate for deriving POC fluxes in different locations. In other words, “one

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size fits all” may not be valid for deriving POC fluxes from Th-234 deficits in all oceanic regions. A final uncertainty is the assumption of steady state. A number of the studies cited tried to estimate the NSS flux from Th-234 profiles taken over an interval of time. The POC fluxes estimated from these might be given in conjunction with the SS flux values, again for comparison. Given all these uncertainties and differences in application of the method from investigator to investigator and region to region, it is noteworthy that the patterns of POC export are sensible and in broad agreement with prior independent work. A major (and critical) unresolved issue is whether the magnitudes are in agreement with other estimates. Nevertheless, this is a valuable contribution to the database on oceanic POC export. Minor point- More data on Arctic (Cape Bathurst Polynya) POC fluxes are available in Amiel and Cochran (2008, JGR, 113, C03S06, doi:10.1029/2007JC004260)

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Interactive comment on Earth Syst. Sci. Data Discuss., 6, 163, 2013.

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