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Comment

***Interactive comment on “Effects of CO<sub>2</sub> on particle size distribution and phytoplankton abundance during a mesocosm bloom experiment (PeECE II)” by A. Engel et al.***

**X. Mari**

xavier.mari@noumea.ird.nc

Received and published: 15 November 2007

I have a few questions/comments regarding the sampling procedure. The mesocosms are 9.5 m depth and samples were collected using 4 m long tubes. The authors state that the sampling procedure allows integrating the upper water column. Did the authors use several tubes immersed at various depths between 0 and 4 m, or did they use the same tube to sample continuously in the 4 m of the upper water column? Additionally, since the whole water column was not monitored, I find very difficult to interpret changes in the particle size distribution and phytoplankton abundance. Since particles distribute vertically according to various parameters, such as their size, shape,

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density, aggregation, one may expect the vertical distribution within the mesocosms to be heterogeneous. For example, is it possible that the higher abundance of small particles occurring in the upper water column of the past treatment was linked to high sedimentation rates of the larger particles? Or, is it possible that the increase in TEP concentration observed at high pCO<sub>2</sub> reduces the vertical export of particles by reducing the density of aggregates, thus, prolonging their retention time in the water column? Therefore, in my opinion, unless the mesocosms were homogenized prior to sampling, observations made in the upper layer alone can hardly be extrapolated to the whole column.

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Interactive comment on Biogeosciences Discuss., 4, 4101, 2007.

**BGD**

4, S1927–S1928, 2007

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