

Belgium

Meetings

- KEOPS 2 pre-cruise workshop, Banyuls, March 2011
- EGU 2012 annual meeting: Session on sensitivity of marine ecosystems, biogeochemical cycles and carbon uptake to global change; talk by Planchon, Cavagna, Cardinal, André & Dehairs: “Late summer carbon export and remineralisation in the Southern Ocean determined from ^{234}Th and particulate biogenic Ba tracers”
- Organisation of the COST-GEOTRACES training school: Are your GEOTRACES data reliable? Institute for Reference Materials and Measurements, Geel, Belgium; 30th May - 1st June 2012 (organisers Damien Cardinal, LOCEAN, Paris VI, Marc Elskens, Vrije Universiteit Brussel, Brussels)

Cruises

- GEOTRACES GP13 (R/V Southern Surveyor), Pacific Ocean, May-June 2011: dissolved Ba
- DIAPICNA (R/V Dom Carlos I), Azores Current, July-August 2011: Primary Production, N_2 fixation, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$ nitrate.
- KEOPS 2 (R/V Marion Dufresne), Southern Ocean, Kerguelen area, Oct.-Nov. 2011. Primary Production; New production; ^{234}Th -based export and subsurface remineralisation fluxes (excess ^{234}Th , particulate biogenic Ba); $\delta^{15}\text{N}$, $\delta^{18}\text{O}$ nitrate; dissolved Ba.
- WOCE section I 9 (R/V Aurora Australis), Southern Ocean, Nov.-Dec. 2011: dissolved Ba

New funding

- Belgian Science Policy, Science for Sustainable Development programme; “BioGeochemical cycles in the SOUTHERN ocean: Role within the Earth System” (BIGSOUTH); 2011 – 2014.
- FP7-EUROFLEETS: “DIAzotrophic Pico-Cyanobacteria in the North Atlantic open ocean: their abundance and importance as a source of new nitrogen at the Azores Front/Current” (DIAPICNA); 2011-2014.
- Flanders Research Foundation, “The biological carbon pump and role of diazotrophs in open ocean carbon export”; 2011-2014.

New results

- Dissolved Ba data for the GP13 section in the South-West Pacific; completes the existing data diss. Ba base for the Southern Ocean
- POC export and mesopelagic remineralisation along Greenwich Meridian (Cape Basin – northern Weddell Gyre).
- Estimates of the contribution of N_2 fixation to primary production in Azores Current region
- Primary production, New production, POC export and mesopelagic remineralisation in the (naturally) iron-fertilised Kerguelen area
- Nitrate isotopic composition in oligotrophic Azores Current region and Kerguelen area

Relevant publications

- Hoppema M., F. Dehairs, J. Navez, C. Monnin, C. Jeandel, E. Fahrbach, H.J.W. de Baar, 2010. Dissolved barium distributions in the Weddell Gyre: Impact of circulation and biogeochemical processes, *Marine Chemistry*, 122, 118-129.
- Fripiat F., A.-J. Cavagna, N. Savoye, F. Dehairs, L. André and D. Cardinal, 2011. Isotopic constraints on the Si-biogeochemical cycle of the Antarctic Zone in the Kerguelen area (KEOPS), *Marine Chemistry*, 123, 11-22.
- Cavagna A.-J., F. Fripiat, F. Dehairs, D. Wolf-Gladrow, N. Savoye, L. André and D. Cardinal, 2011. Silicon uptake and supply during a Southern Ocean iron fertilization experiment (EIFEX) tracked by Si isotopes, *Limnology and Oceanography*, 56, 147-160.
- Fripiat F., K. Leblanc, M. Elskens, A.-J. Cavagna, L. Armand, L. André, F. Dehairs and D. Cardinal, 2011. Summer efficient silicon loop across the Polar Front and SubAntarctic Zones despite contrasted diatom Si-affinity, *Marine Ecology Progress Series*, 435, 47-61.
- Fripiat F., A.-J. Cavagna, F. Dehairs, S. Speich, L. André, and D. Cardinal, 2011. Silicon pool dynamics and biogenic silica export in the Southern Ocean inferred from Si-isotopes, *Ocean Sciences*, 7, 1-15, doi:10.5194/os-7-1-2011.
- Jacquet S.H.M., F. Dehairs, I. Dumont, S. Becquevort, A.-J. Cavagna and D. Cardinal, 2011. Twilight zone organic carbon remineralization in the Polar Front Zone and Subantarctic Zone south of Tasmania, *Deep-Sea Research II*, 58, 2222-2234.
- Bowie A.R., F. B. Griffiths, F. Dehairs and T.W. Trull, 2011. Oceanography of the subantarctic and polar frontal zones south of Australia during summer: setting for the SAZ-Sense study, *Deep-Sea Research II*, 58, 2059-2070.
- Jacquet S.H.M., P.J. Lam, T.W. Trull and F. Dehairs, 2011. Carbon export production in the Polar Front Zone and Subantarctic Zone south of Tasmania, *Deep-Sea Research II*, 58, 2277-2292.
- Cavagna A.-J., M. Elskens, F. B. Griffiths, S.H.M. Jacquet and F. Dehairs, 2011. Contrasting regimes of productivity and potential for carbon export in the SAZ and PFZ south of Tasmania, *Deep-Sea Research II*, 58, 2235-2247.
- Bowie A.R., T.W. Trull & F. Dehairs, 2011. Estimating the Sensitivity of the Subantarctic Zone to Environmental Change: the SAZ-Sense project, *Deep-Sea Research II*, 58, 2051-2058.
- Thomas H., E. Shadwick, F. Dehairs, B. Lansard, A. Mucci, J. Navez, Y. Gratton, F. Prowe, M. Chierici, A. Fransson, T. Papakyriakou, E. Sternberg, L. Miller, C. Monnin, 2011. Barium and Carbon fluxes in the Canadian Arctic Archipelago, *Journal of Geophysical Research-Oceans*, 116, C00G08, doi:10.1029/2011JC007120.
- Baeyens W., Bowie A., Buesseler K., Elskens M., Gao Y., Lamborg C., Leermakers M., Remenyi T., Zhang H., 2011. Size-fractionated labile trace elements in the Northwest Pacific and Southern Oceans, *Marine Chemistry*, 126, 108-113.
- Fripiat F., A.-J. Cavagna, F. Dehairs, A. de Brauwere, L. André and D. Cardinal, 2012. Processes controlling the Si-isotopic composition in the Southern Ocean and application for paleoceanography, *Biogeosciences*, 9, 1-15.
- Cavagna A.-J., F. Dehairs, V. Woule-Ebongué, S. Bouillon, F. Planchon, B. Delille, I. Bouloubassi, 2012. Whole water column distribution and carbon isotopic composition of POC-bulk, cholesterol and brassicasterol from the Cape Basin to the northern Weddell Gyre, *Biogeosciences Discussion*, 9, 1667-1709.
- Planchon F., A.-J. Cavagna, D. Cardinal, L. André and F. Dehairs, 2012. Late summer particulate organic carbon export from mixed layer to mesopelagic twilight zone in Atlantic sector of Southern Ocean, *Biogeosciences Discussion*, 9, 1-43.
- Maiti K., K.O. Buesseler, S.M. Pike, C. Benitez-Nelson, P. Cai, W. Chen, K. Cochran, M. Dai, F. Dehairs, B. Gasser, R. P. Kelly, P. Masque, L. Miller, J.-C. Miquel, S. B. Moran, P.J. Morris, F. Peine, F. Planchon, A.A. Renfro, M. Rutgers van der Loeff, P. Santschi, R. Turnewitsch, J.T. Waples, C. Xu, Intercalibration studies of short lived Thorium-234 in the water column and marine particles, *Limnology & Oceanography - Methods*, accepted for publication.

- Schmidt S., J. Harlay, A.V. Borges, S. Groom, B. Delille, N. Røevros, S. Christodoulou and L. Chou, 2012. Particle export during a bloom of *Emiliana huxleyi* in the North-Western Bay of Biscay, *Journal of Marine Systems*, doi: 10.1016/j.jmarsys.2011.12.005 (in press).

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