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Comment

## ***Interactive comment on “Use of Ra isotopes to deduce rapid transfer of sediment-derived inputs off Kerguelen” by V. Sanial et al.***

**V. Sanial et al.**

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The authors thank the editor for carefully following the publication process of this manuscript.

Reviewer 2 does not refer to an upstream plateau further away than the LeClaire rise. In his review, Reviewer 2 provided a figure displaying a Google map showing a plateau west of the Kerguelen Islands and asks if this plateau could be a source of Ra for the investigated area. On this map, Reviewer 2 points to a topographic feature which is the Le Claire rise (see Fig 1 below). In the revised manuscript, we now discuss the possibility that this topographic feature constitutes a source for Ra isotopes. Details can also be found in the response to Reviewer 2 that we posted on the Biogeosciences website.

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Regarding the Crozet Plateau as a potential Ra source for the Kerguelen region, note that the Crozet Plateau is localized north of the Kerguelen Islands and also far north from the Polar Front (see Fig.2 below from Park et al., 1998). Sanial et al. (2014) recently published Ra data collected in the framework of the Keops-2 project off the Crozet Islands. In particular, short-lived radium ( $^{223}\text{Ra}$  and  $^{224}\text{Ra}$ ) activities could be detected only in the near vicinity of the Crozet Islands. Charette et al. (2007), in the framework of the Crozex project, found a similar pattern. Surface samples collected during the Keops-2 project east of the Crozet Islands (i.e. between the Crozet Islands and the Kerguelen Islands; Fig.3), do not show significant short-lived Ra activities, which suggest that the Crozet Islands are not a  $^{223}\text{Ra}$  and  $^{224}\text{Ra}$  source for the Kerguelen region (Sanial et al., 2014).

Charette, M. A., Gonneea, M. E., Morris, P. J., Statham, P., Fones, G., Planquette, H., Salter, I. and Garabato, A. N.: Radium isotopes as tracers of iron sources fueling a Southern Ocean phytoplankton bloom, *Deep Sea Res. Part II Top. Stud. Oceanogr.*, 54(18–20), 1989–1998, doi:10.1016/j.dsr2.2007.06.003, 2007.

Park, Y.-H., Charriaud, E., Pino, D. R. and Jeandel, C.: Seasonal and interannual variability of the mixed layer properties and steric height at station KERFIX, southwest of Kerguelen, *J. Mar. Syst.*, 17(1-4), 571–586, doi:10.1016/S0924-7963(98)00065-7, 1998.

Sanial, V., van Beek, P., Lansard, B., d' Ovidio, F., Kestenare, E., Souhaut, M., Zhou, M. and Blain, S.: Study of the phytoplankton plume dynamics off the Crozet Islands (Southern Ocean): A geochemical-physical coupled approach, *J. Geophys. Res. Oceans*, 119, 2227–2237, doi:10.1002/2013JC009305, 2014.

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Interactive comment on Biogeosciences Discuss., 11, 14023, 2014.

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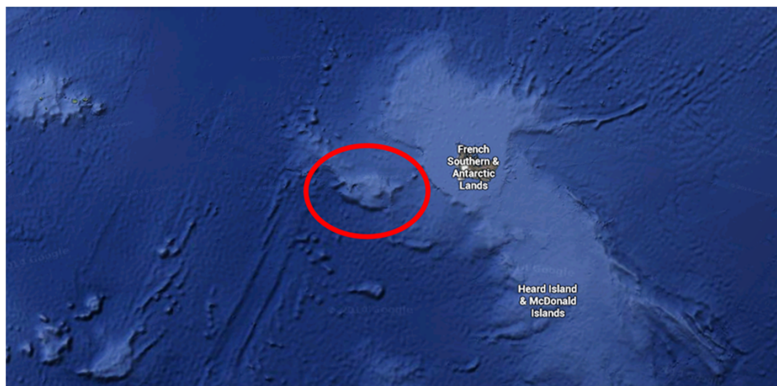


Fig. 1. Plateau as possible Ra-source west of Kerguelen plateau. Source: Google Maps.  
From bdg-11-C7062-2014-1

Fig. 1.

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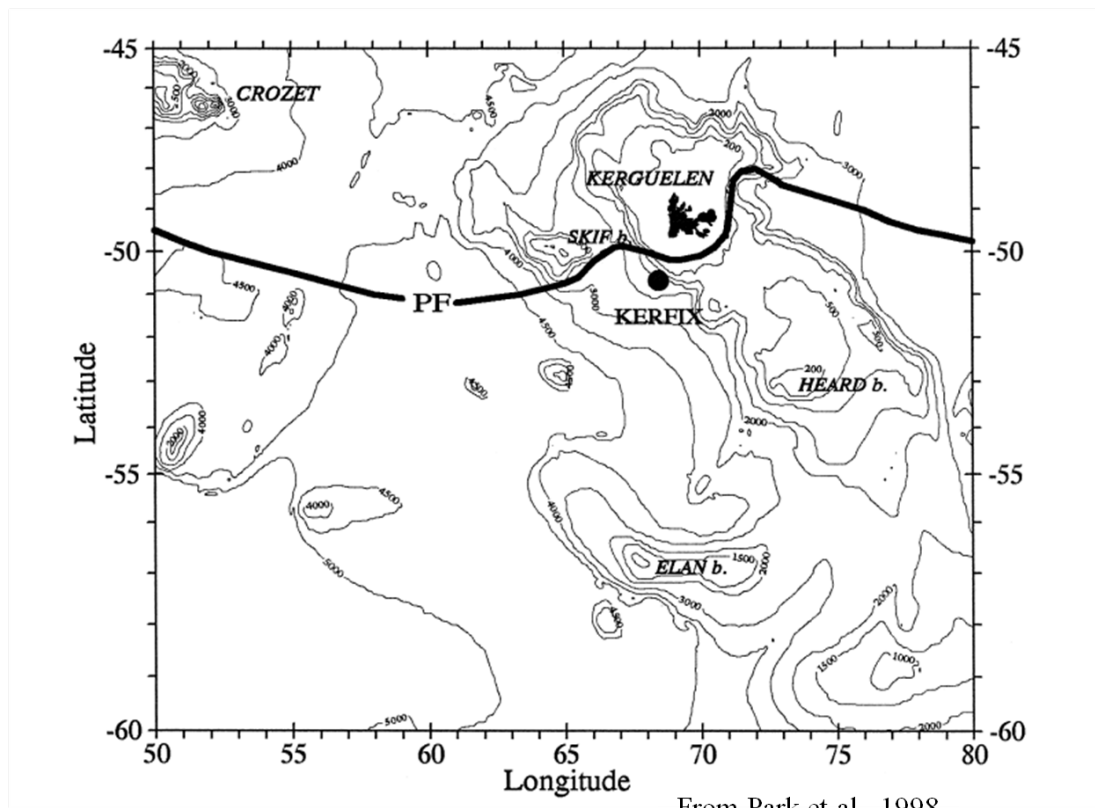
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Fig. 2.

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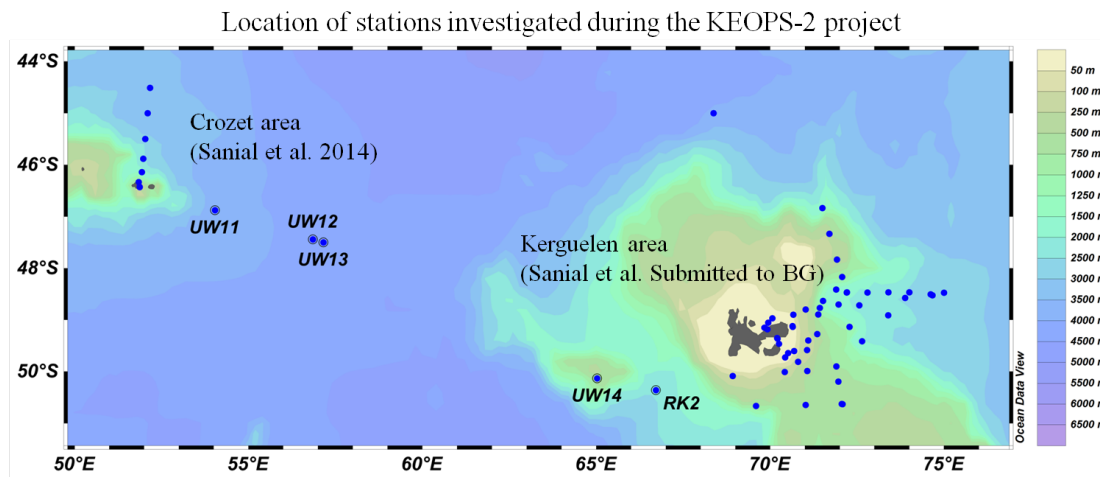


Fig. 3.

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