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

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We thank the reviewer for her/ his positive comments on the manuscript. We took the comments into consideration in the revised manuscript.

Section 4.1 It is indeed interesting to compare the Ra distribution in surface waters that highlights cross-frontal input of chemical elements and the chlorophyll distribution that is expected to respond to this input of chemical elements. We agree with the reviewer remark that the cross-frontal transport of chemical elements highlighted by the short-lived Ra isotopes may be a minor source, when considering the chlorophyll images: east of the Kerguelen Islands, indeed, there is an area with relatively low chlorophyll concentrations, which could suggest that the eastward input of chemical elements through the front has a minor impact on the development of phytoplankton.

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In contrast, large blooms are observed north of the Kerguelen Islands and above the southern Kerguelen Plateau that suggest a major impact of the direct advective transport from the islands (Kerguelen Islands and Heard Island). However, the cross-frontal transport of chemical elements may not only take place east of the Kerguelen Islands but also all along the Polar Front (that is, north and east of the “recirculation area”). This transport could contribute to fuel the large phytoplankton blooms observed in these areas and thus should not be neglected.

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