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Interactive comment on "The 129-Iodine content of subtropical Pacific waters: impact of Fukushima and other anthropogenic ^{129}I sources" *by* T. P. Guilderson et al.

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Page 19951, bottom - the authors mentioned that ". . .samples passing through Monaco since at least 1997 and continuing to present have inadvertently picked up 129I from the more common "environmental" samples with high 129I that are handled by the IAEA. Such inadvertent 129I contamination is not unprecedented (Szidat et al., 2000). "

There has not been handling in the past in Monaco of any "high" 129I content samples that could make contamination problems. All samples were of environmental 129I levels, and actually an intercomparison of AMS laboratories on 129I analysis was orga-

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nized in Monaco, which did not show any contamination problems (Pham et al., 2010– this reference is omitted in the paper of Guilderson et al.).

PHAM, M.K., BETTI, M., POVINEC, P.P., ALFIMOV, V., BIDDULPH, D., GASTAUD, J., KIESSER, W.E., LOPEZ GUTIERREZ, J.M., POSSNERT, G., SANCHEZ-CABEZA, J.A., SUZUKI, T. Certified reference material IAEA-418: 129I in Mediterranean Sea Water. Journal of Radioanalytical and Nuclear Chemistry, 286 (2010) pp. 121-127

Another possibility could be a contamination with surface water during sampling. During the IAEA'97 cruise (as well as during other cruises) 129I samples were collected from Rosette bottles, 1L for 129I and 1L for 3H analyses, well closed in glass bottles. A comparison of 3H and 129I results (see e.g. Povinec et al., 2010) did not show any inconsistencies, therefore we can rule out surface water contamination problems. Another possibility, of course, could be a contamination during sample preparation and AMS analysis. All the 129I analyses (until Fukushima samples, which were analyzed by the Tucson and Vienna AMS laboratories, for which targets were prepared by Riso lab) were done by the Isotrace laboratory of the Toronto University, which did not have any contamination problems, regularly checking for blank samples, and participating in intercomparisons. The background 129I levels were 1-2 orders of magnitude lower than the measured bottom water samples.

Therefore, if there are inconsistencies between the results discussed by Guilderson et al. and Povinec et al., 2010, they must have another origin than a contamination.

A few suggestions:

The Guilderson et al. paper is treating the Pacific Ocean as a single box, not paying attention to spatial (a figure showing sampling stations is missing) and depth distribution of 129I – discussion on different water masses present in the Pacific is missing as well, generally, the oceanographic description is weak.

129I/127I ratio is sensitive on the content of stable 127I in seawater (which was not

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measured, and may be a source of irregularisties), therefore we preferred to present results as atoms/L.

The 129I data well correlated with 3H data, except for the Bikini/Enewetak stations, where possible impact could be expected. When we look on the 3H and 129I profiles at these stations (Povinec et al., 2010) we see a fast decrease to bottom concentrations at depths of around 500 m (compared to 1000 m at other stations).

The relative uncertainties of 129I measurements in bottom waters are around $\pm$10%, sometimes even bigger. However, these are only statistical uncertainties associated with the analysis. The total uncertainties (including other sources, e.g. sampling) should be at least by a factor of 2 bigger, therefore if we take 3 sigma level as a meaningful value for any deviations, the uncertainties could go easily to $\pm$60%, what should be taken into consideration when interpreting 129I data. Generally we should have in mind that deviations in the oceanographic data which are within a factor of two do not represent any meaningful basis for specific interpretation.

Fig. 11: . . .”Note that regardless of location: western subtropical North Pacific (stations 2, 3: squares) or low latitudes near Bikini/Enewetak (stations 6, 7: diamonds) that the IAEA 97 data imply a significant 129I excess at all depths”.

As already mentioned - St. 6 and 7 (the stations with the highest bottom 129I levels) had very specific 129I water profiles, see Povinec et al. 2010 (which cannot be seen in logarithmic scale in Fig. 11). As we can rule out possible contamination of samples, our hypothesis was that the enhanced levels could be due to the Bikini/Enewetak impact. We also prefer to show 129I levels in atoms/L, and not by the 129I/127I ratio, which could be influenced by variations in the 127I content (not measured in all these samples). Another point is that all the results should be presented with error bars, and only data outside of 3 sigma should be taken as possible deviations (having in mind again that the error bars represent only statistical uncertainties, but not the total uncertainties).

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Text: The authors make several times a reference to the paper Povinec et al., 2012, however this reference is absent in the reference list.

P.P. Povinec, R. Breier, L. Coppola, M. Groening, C. Jeandel, A.J.T. Jull, W.E. Kieser, S.-H. Lee, L. Liong Wee Kwong, U. Morgenstern, Y.-H. Park, Z. Top. Tracing of water masses using a multi isotope approach in the southern Indian Ocean. Earth and Planetary Science Letters, Volume 302, Issues 1–2, 1 February 2011, Pages 14-26

This paper is also important as it shows much lower 129I levels in the southern Pacific Ocean than in the northern one (thus ruling out possible "contamination problems in the Monaco laboratory"), and also because it discusses 129I levels in subsurface waters influenced by different water currents.

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