

Interactive comment on “An inter-laboratory investigation of the Arctic sea ice biomarker proxy IP₂₅ in marine sediments: key outcomes and recommendations” by S. T. Belt et al.

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Belt et al. present the results and outcomes of an inter-laboratory comparison study on the determination (identification and quantification) of the Arctic sea ice biomarker proxy IP₂₅ in marine sediments. In recent years, an increasing number of studies and laboratories report abundances of IP₂₅ in sediments from various Arctic regions. Given this and the importance of paleo sea ice reconstructions, Belt et al address an essential, if not crucial, issue regarding the confidence in interpretations based on IP₂₅, through this inter-laboratory experiment, in line with experiments carried out previously for other organic proxies, such as the Uk'37 and TEX86 indices. The number

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of participating laboratories is however small, and despite the first useful outcomes regarding the importance of carrying out accurate and quality controlled analyses, there is a strong need for a follow up of such inter-laboratory investigations with much more participants involved, since it is also evident that the analysis of IP₂₅ is becoming widespread. The fact that three out of seven labs detected and quantified the IP₂₅ in sample S4 is an alarming issue. In view of the results it is evident that the need to report analytical procedures, precision etc., that is elements that ensure the reliability of IP₂₅ results, is compulsory. Yet, many papers on IP₂₅ are published in paleo-climate journals where quite often such information is missing. The same holds true for the identification of IP₂₅ in sample S5. Unlike other molecular proxies (UK37, TEX, BIT) it is evident that analytical procedures for IP₂₅ are much more challenging, and great caution is to be taken. The point raised by J. Volkman regarding the minimum value below which an inference of sea ice would be unreliable is an important and challenging one that has to be addressed by the authors. Overall, I believe that this well-written paper on the inter-laboratory experiment is an important path (along with the Belt et al 2012, in Analytical Methods) towards rendering the IP₂₅ data reliable. Taken into account the outcomes of this study along with the conclusions of the Belt et al. 2012 paper, the authors should address with more emphasis clear guidelines (not only suggestions) for current and future IP₂₅ analysts. This will also help evaluating existing and future IP₂₅ reports in the literature and will be of great value for referees.

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