

***Interactive comment on “The enigmatic ichnofossil *Tisoa siphonalis* and widespread authigenic seep carbonate formation during the Late Pliensbachian in southern France” by B. van de Schootbrugge et al.***

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Dear Editor and authors,

The authors of this paper describe the development of tubular carbonate concretions in the Upper Pliensbachian of Southern France. These concretions, called *Tisoa Siphonalis*, are studied since the 19th century. In the light of recent studies on fluid-related structures in the sub-seafloor, they propose a new interpretation for these concretions. They first focus on isotopic analyses showing depleted values of  $d_{18}O$

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toward the center of tubes, that could be related to AOM in the presence of methane and sulfate-rich fluids. Then, they present a new tool for visualizing the inner structure of these tubular concretions, based on a portative tomographic scanner (CT). They attempt to show the benefits in using the CT system compared to more conventional outcrop studies.

In my opinion the data as presented in this manuscript do support the interpretation and the conclusions presented by the authors. The resolution is quite spectacular and the use of CT will undoubtedly improve the interpretation of these tubular concretions. However, I have few comments, that do not need to be addressed for this paper to be published, but that could be the subject for further studies:

> It would be interesting to do thin sections analysis in order to determine paragenesis. It is particularly important to define early stages of carbonate precipitation. > Even if the resolution of CT is spectacular, it would be interesting to relate these results to paragenesis (see above). > It would be interesting to do fluid inclusions in order to analyse: 1) the fluid composition and 2) the temperature at which the inclusion closed. This could confirm the early nature of these concretions.

The study results are very interesting as they will really help interpreters on describing new structures or, at least, they will allow better comparison with known outcropping analogues. The authors give adequate background information and citations necessary to understand.

My feeling is that this paper is essential for the community working on sub-seafloor features, either fluid-related structures or sedimentary bodies. So, I do recommend the manuscript to be published in its present form as my concerns do not need many corrections and comments.

Aurélien Gay

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