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Interactive comment on “Lunar periodicity in the shell flux of some planktonic foraminifera in the Gulf of Mexico” by L. Jonkers et al.

Anonymous Referee #3

Received and published: 8 April 2015

This paper describe lunar periodicity of shell flux of modern planktic foraminifers recovered by sediment trap experiments in the Gulf of Mexico. General ecology of planktic foraminifera is reported by many papers, but especially, the reproductive phase/periodicity is still poorly known. This manuscript will provide a new information about lunar and semi-lunar periodicity of some planktic foraminiferal species in the subtropical realm of the Gulf of Mexico. Time resolution of this study is extremely high (weekly resolution!) compared with previous related studies by moored time-series sediment traps, and it should have a potential to resolve enigmatic planktic foraminiferal ecology. On the other hand, I think that the information to discuss about the reproductive periodicity and their ecological relationships are insufficient. A part of the assemblage data as a base of this manuscript is excellent and it has already published some reviewed journal/reports, so the quality of assemblage data is sufficient.

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Comment1: The authors defined that empty shell flux of planktic foraminifera is the reproductive individual, however the shell length (size) of each species does not shown. How does the authors define the adult (reproduced) specimen? Individuals larger than 150 μm include not only adult specimen but also immature (pre-reproduced) specimen. For instance, *G. siphonifera* and *G. sacculifer* in the tropical-subtropical regions become larger than 700 μm . Although the separation of the reproduced specimen is difficult by only the shell length in general, it is the one of the key factors. It should be shown size distributions of each species as the basic dataset.

Comment2: Lateral transportation of biological particles is the most concerning issue of this manuscript. The Gulf of Mexico is very famous place of deep-sea turbidites/landslides. The location of sediment trap used in this study was very close to the large continental shelf (probably less than 100km as direct distance?) , therefore sinking particles may be possibly disturbed by deep-sea turbidites and related material transportations. Especially I'm concerning that fluctuation of sea tide synchronize to the lunar periodicity, therefore material transportation also occur at the same timing. In this case, shell flux of some planktic forms may look increasing apparently during full/new moon phases. It is needed to exclude or discuss the possibility of lateral transportation of shells. And if available, please add current direction/speed data through the whole observation periods. In addition, lithologic material data is also important.

Comment3: The authors described that lunar periodicity comes from exogenous nature in planktic foraminifera. What kind of exogenous "factors"? I think the ecological information and description of planktic forms are absolutely lacking in this manuscript. For example, metabolism of cell inducing gamete creation in living planktic foraminifera is probably related to temperature, food availability, and light intensity (for symbiont bearing species) etc. The authors should show some possibility /hypothesis from the many observable oceanographic environmental factors to make breakthrough of living planktic foraminiferal ecological studies. Lunar /semi-lunar periodicity of reproduction of planktic foraminifera was already described by several authors, so it is lack of novelty.

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Minor items: 1) Indices of all figures should be used more larger characters. 2) Information of methodology are not sufficient: For example, information of sample collections, deployed periods, methodology of counts of foram shells etc. (e.g. A McLane PARFLUX Mark 78 automated sediment trap was deployed in early January 2008 in approximately 1,150 meters (m) of water depth at approximately 27.5 oN latitude and 90.3 oW longitude. The trap is equipped with 21 collection cups that are mounted on a rotating plate that is programmed to rotate every 7 or 14 days.) 3) Please check the spelling of Prof. Bé. 4) p17194: other “than”?

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