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Interactive comment on "Seasonal variability and sources of in situ brGDGT production in a permanently stratified African crater lake" *by* Loes G. J. van Bree et al.

Anonymous Referee #1

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This is a well written and timely contribution, focusing on the distribution of branched GDGTs in Lake Chala, Kenya. The data support the conclusions, and move forward our understanding these biomarkers as potential environmental proxies.

Main points: 1. brGDGTs produced primarily in situ in the water column of Lake Chala a. distinct distribution from soils b. also appears to be production in sediments, as they are distinct from water and soil brGDGTs 2. brGDGT distribution changes with depth and season, but not exactly as expected if driven by environmental parameters 3. Likely this is due to production by various different bacterial groups producing at different times, rather than a single group changing lipids 4. brGDGTs do not correlate

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Discussion paper

well with Acidobacteria rRNA, suggesting other groups are more dominant producers

The research discussed here is an important step towards determining source organisms of brGDGTs and the extent to which their distribution actually reflect temperature, pH, or other parameters.

I'd like to see some discussion of how this system is unique, and whether they think that would bias the results. For example, Chala is a crater lake with very little terrestrial input. What about a system with very different morphology that does get a lot of terrestrial input? This sort of reflection would be easy to add to the implications section, and would figure strongly in how broadly the results from Chala are likely to apply.

I did notice a few typos scattered throughout (e.g. line 199 should read "...liquid chromatograph..."; line 648 should read "...related to temperature..."), but one more detailed read by the authors should find these.

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