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Interactive comment on “Abiotic ammonification and gross ammonium photoproduction in the upwelling system off central Chile (36° S)” by A. Rain-Franco et al.

Anonymous Referee #2

Received and published: 8 February 2013

This study provides insights about photo- and bio-ammonification in an upwelling region off the coast of Chile. Experiments were conducted under varying conditions to investigate photochemical and microbial ammonification processes and the potential role of photochemical processes in the stimulation microbial ammonification. This is an interesting twist because it suggests photochemical processes could play an important role in making DON more susceptible to microbial ammonification. The nature of the experiments limits their usefulness in providing in situ rates of processes, so the results are indicative of the potential impact on N cycling in the environment. Nonetheless, the study provides data on UV radiation in coastal waters and highlights the role of photochemistry in the N cycle of surface waters.

C8077

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Comments and Suggestions: Suggested Title: Photochemical and microbial ammonification in the upwelling system off central Chile (36°S)

Terminology: photoammonification should be used instead of abiotic ammonification, which is vague and does not describe the process. The term, “gross ammonium photo-production”, is confusing because most of the ammonium being produced is not directly from photoammonification.

Were any chlorophyll measurements made in the GFF filtered seawater samples used for experiments? It is unclear whether phytoplankton were present in the experiments and influenced ammonium dynamics.

Mercuric chloride was used in killed controls to estimate photoammonification, and it is unclear whether mercuric chloride influences the photoammonification process. Were any filtered seawater (<0.2 µm) controls used for comparison to mercuric chloride controls?

The data in Table 1 indicates different light exposures were used for samples and that simulated UV radiation was relatively high.

Fig. 2 – it would be useful to add the mixed layer and chlorophyll maximum depths to the time series data in panel B.

Pg 18481, Line 24 – should be “Orinoco River plume”

Pg 18502, Line 5 – “glycine” should be “glycine”

The authors should see the articles by Xie et al. 2012 in Biogeosciences on photoammonification in the Beaufort Sea and Smith 2005 AquatMicroEcol on the rapid heterotrophic utilization of ammonium released during photoammonification.

Interactive comment on Biogeosciences Discuss., 9, 18479, 2012.

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