The purpose of the paper is stated as follows:
"In this study we use Sr/Ca ratios in nannofossil calcite to reconstruct changes in primary productivity of calcareous nannoplankton in the South Atlantic during ETM2. This geochemical proxy has been shown in culture and field studies to be a good measure for the productivity of coccolithophores (Rickaby et al., 2002; Stoll et al., 2002a, b, 2007a). It is also shown that nutrient availability is the main controlling factor. In addition, Sr/Ca is an ideal proxy to reconstruct productivity changes during ETM2, because of the fact that long residence time of both, Sr and Ca in seawater exceeds the duration of transient climatic events such as hyperthermals. Studies applying this new method have demonstrated increased primary production during upwelling events or in coastal (proximity) settings in both extant and fossil calcareous nannoplankton (Stoll et al., 2007a, b; Auliaherliaty et al., 2009)."

In this manuscript, Sr/Ca variability is viewed upon solely via a 'productivity' filter, and other information is pushed aside by sometimes light weight arguments so as not to disturb the faith in productivity as the key factor influencing Sr/Ca ratios in coccolith carbonate. Neglect of the complications involved in interpreting Sr/Ca ratios in coccolith carbonate implies that a thoroughly revised manuscript must be presented prior to publication.

In the early phase of analyzing Sr/Ca ratios in coccolith carbonate, productivity was not on the table (Stoll and Schrag 2000). Rickaby et al. 2002 (see above) don't mention productivity at all but concludes that "our empirically derived relationship between D_{Sr} and carbon-specific growth rate shows potential for a combined geochemical proxy approach, using Sr/Ca and εp, for reconstructing paleo-pCO_2".

Stoll et al. 2002b (ref. in present ms) arrived to the same conclusion: "Despite the dual influence of temperature and growth rate on coccolith Sr/Ca, coccolith Sr/Ca correlates with “b,” the slope of the dependence of carbon isotope fractionation in biomarkers (εp) on CO_2(aq) at a range of growth rates and temperatures. Consequently, using coccolith Sr/Ca in combination with alkenone εp may improve paleo-CO2 determinations." They also say: "The strong influence of calcification rate on Sr partitioning may be useful for inferring past variations in coccolithophorid productivity from Sr partitioning in coccolith sediments *if the influence of temperature on Sr partitioning can be resolved*." [my italics]
And state that: "We obtain a 1% increase in Sr/Ca for a 1°C increase in calcification temperature."

Stoll et al. 2002a (ref. in present ms) concludes: "*Consequently, temperature changes could contribute significantly to variations in coccolith Sr/Ca in marine samples*. It may be possible to separate these influences on coccolith Sr/Ca by separately analyzing Sr/Ca in species that produce calcite rapidly and those that produce calcite slowly, *if both undergo comparable relative changes in calcification rates*." [my italics].

Compare all the above discussion referring to the influence of temperature on Sr/Ca ratios in coccolith carbonate with the unreferenced statement in the purpose paragraph above: "It is also shown that nutrient availability is the main controlling factor."

All the above inferences about Sr/Ca ratios in coccolith carbonate are made on modern floras, and applied, without comment, to early Eocene nannofossil assemblages.

Other comments.
Spell out 'CIE'.
No need to repeatedly state that an ion probe was used to analyze the Sr/Ca ratios. OK in Abstract and Methods, but not thereafter.

"Dedert et al., 2011" doesn't refer to a publication but to work in preparation and is hence meaningless for the reader.

"We measured the Sr/Ca ratio by ion probe in four individual taxa, each with distinct environmental preferences." [see Methods]. First, it is not explained which these preferences are. Second, compare this unreferenced statement with the introductory sentence under 4.2: "The Sr/Ca productivity trends presented in this study appear to contradict those inferred from changes in nannofossil assemblages for this site, in that meso-trophic and eutrophic placoliths decrease in abundance." This is followed by an argument that dismisses the nannofossil census data, blaming dissolution, so as to be able to go along the 'productivity' track; the 'productivity' bias/filter is clearly at work here, giving the impression that contradictory data sets are not going to disturb the preconceived ideas about how the Sr/Ca data should be interpreted.

"The amount of overgrowth on liths of *Discoaster*, *Tribrachiatus* and *Zygrhablithus* is strongly correlated to the carbonate content of the sediments, with the degree of overgrowth decreasing within low carbonate content sediments of the *Elmo* horizon." This doesn't go along well with (see 3.3): "The contribution of abiogenic calcite .... in the *Elmo* horizon, whereas contribution of overgrowth to the discoaster fraction remains ~50 %." Carbonate decreases to about 55-60 %. Would have expected that overgrowth increased on the above dissolution 'resistant' taxa when the amount of dissolved carbonate increased from dissolved, more dissolution prone taxa. Would be nice to get some more information about this.

"Long-term trends in Sr/Ca measured in bulk fine (<20 μm) sediments reveal a cyclic forcing, possibly precessional, as was identified in $\delta^{13}C$ records (Stap et al., 2009), although Sr/Ca trends are less salient in proximity of the ETM2 interval (precession cycle numbers one, two and five; Fig. 4a)." Difficult to see cycles in the bulk record. Precession cycles in Stap's record gives three high values and three low values in the bulk Sr/Ca data.

4.1.1 - "genera" should be "genus"

The key message in this manuscript is that productivity increased during the ETM2, as based on a marked increase in the Sr/Ca ratio in coccolith carbonate. This increase is clearly seen in the bulk sediment data (Fig. 4a). It is unclear why the authors go

through the laborious process of separating and analyzing individual nannofossil genera. This certainly generates plenty of text, but does it really provide crucial information? Questionable.

It is difficult to agree with the conclusion (see Summary) that "...variations in Sr/Ca across the ETM2 interval and at certain intervals in the bulk fine Sr/Ca record imply a cyclic forcing on the productivity."

In conclusion, this manuscript provides a very restricted, biased and unconvincing interpretation of the meaning of Sr/Ca variability in coccolith carbonate.

The paper is suitable for CP and provides new Sr/Ca data from ODP Site 1265.
The conclusions are hardly substantial and hold some wishful thinking about cyclicity.
The assertion/assumption that Sr/Ca data in coccolith carbonate can be interpreted solely in terms of productivity is not convincing, considering other (cited) work.
The interpretation of the Sr/Ca data stands in contrast to the nannofossil census data, which thus are dismissed by non-convincing arguments.
Title is ok if one accepts that the Sr/Ca data presented reflects productivity, otherwise not.

On a five grade scale (5=highest) this manuscript clearly falls below 3.