

## ***Interactive comment on “On the use of ATSR fire count data to estimate the seasonal and interannual variability of vegetation fire emissions” by M. G. Schultz***

**Anonymous Referee #1**

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A) General Comments As mentioned in this paper, investigations are urgently needed in the estimate of biomass burning emissions. Indeed, major uncertainties exist at different levels in the proposed inventories: for example, inventories based on statistics (Hao et al., 1991, Hao and Liu, 1994, Cooke and Wilson, 1996 and Lioussé et al., 1996 inventories) use burnt biomass estimates with a factor of uncertainty of 2 to 3. Cooke et al., in 1996 has shown how to improve qualitatively uncertainty on fire seasonality by using AVHRR satellite day-time fire pixels. A huge improvement has been realized in the paper of Barbosa et al., 1999 showing how to reduce quantitatively uncertainty on biomass burning estimates by using burnt area products given by satellite data. However, such an approach is possible for the decade 1981-1991 and for the year 2000. The work presented by M. Schultz could be very important for the community.

Nothing exists allowing descriptions of emissions between 1991-2000. These results for 1996-2000 even if they have to remain qualitative could help to complete such a dataset. For this reason and because different groups of modelers will be interested to use such data, it is very important that important revisions which are below described were performed especially dealing with the methodology used in the paper. Manuscript is not acceptable for publication in ACP journal without major revisions; the reviewer would like to see again the paper once these revisions will be done (if it is possible).

## B) Specific comments

1- As mentioned in the above paragraph the idea to use satellite pixel fire count to derive biomass burning inventory is not new; indeed Cooke et al., 1996 (inventory available in the GEIA database) has already used such a method showing the improvements but also their limits. However this study used day-time fire pixel counts given by AVHRR satellite whereas the paper of Schultz uses night-time fire pixels given by ATSR. It is important to underline that in western Africa for example (which has an important contribution in biomass burning emissions) night-time fire data do represent only 20% of the total fires. Therefore the justification given in the paper for the use of such products based on boreal fire study (Stocks) has to be reconsidered. Indeed, in Canada large fires detected during the night by satellite data contribute to large burnt areas whereas fires in Africa, which contributes to large burnt areas are most of the time day-time fires only. Then, day-time fire data which exist for such period (1996-2000) should be used to compare regionally with night-time data. By this way, uncertainty for this method could be better estimated. 2- Also as mentioned by different works maps of fire counts can be produced whereas no burnt areas may be found. It is then very important to cross different tools to better estimate false detections (TM, etc.) which is needed here. 3- There are no clear explanations to scale the inventory given by ATSR by 1.2 to compare with the standard inventory based on Hao and Liu, 1994 work. A global average for such a scaling due to the variability of fires and consequent emissions seems to be not appropriate. Also it is important to recall that Hao

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and Liu inventory has a factor of 2 and 3 of uncertainty in the estimate of the burnt biomass. 4- The discussion dealing with the comparison with Barbosa paper does not bring new conclusions in this paper because Barbosa et al., 1999 proposed inventories for the 1981-1991 years instead of 1996-2000. Also in recent studies inventory derived from Hao et al papers has been seen to be included in the range proposed by Barbosa. 5- Also finally because ATSR data are not combined with vegetation map, how to be quantitative to propose interannual change in the emission budgets (see table 2) when we know the recognized importance of emission factors with vegetation types? A test could be done taking this factor in consideration.

### C) Technical corrections

Reference list has to be completed : main references on this topic are not reported especially those who have already used same methods.

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