

## ***Interactive comment on “The ALTIUS mission” by Didier Fussen et al.***

**Didier Fussen et al.**

didier.fussen@oma.be

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[General]REF 1 I am happy to accept this work with minor corrections but I do want to make it very clear that this is not a scientific paper in the typical sense. It provides a very brief description of all aspects of the ALTIUS mission including the platform, orbit, instrument, scientific goal, methods and algorithms to produce data products, etc  
REPLY: We agree that the paper does not provide data or even the performance level of a final calibrated instrument. As correctly mentioned by the referee, it out-of-scope for a single generic paper and, for some technical studies, not mature enough. For instance, the straylight budget is not yet known and can only be performed once the final instrument design has been completed. However, science not only consists of validated data but also of new ideas (and not simple wishes) capable of tackling the need of atmospheric limb data. The main ideas proposed for the ALTIUS mission are: 1) the concept of spectral imaging in limb scattering observations that should allow for solv-

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ing the tangent altitude registration problem. Furthermore, spectral imaging allows for inertial pointing observations and therefore "cheap" occultation measurements. Very recently, we were told that NASA is now considering a SAGE 4 concept based on solar occultations in spectral imaging. 2) ALTIUS introduces also the concept of multimode observations from a small agile platform that allows for observation time optimization but also for self-correlation measurements (fi limb wrt solar occultations at the same geolocation). 3) the paper expresses the mission requirements as they were recently reviewed by ESA. We expect that the mission pre-developments will improve the expected performance.

[1]REF1 specify LTAN REPLY: LTDN of 10:00 am mentioned

[2]REF1 typo "small small" REPLY: corrected

[3]REF1 figures 5 6 8 9 10 11 19 REPLY done

[4]REF1 Fig 5 caption: sentence about the terminator REPLY The terminator moves in the map during a revolution. Sentence slightly changed

[5-6] REF1 Fig 7 REPLY Number of observations per day. We define pure bright limb situations where SZA < 70° . Corrected.

[7] REF1 Color code of Fig 10 REPLY Changed. Each star has a different color to avoid confusion.

[8] REF1 No apparent noise in Fig 15 conflicts with Fig 13. REPLY Good point. Caption changed as Fig 15 actually represents atmospheric slant path transmittance, that was extracted from averaged GOMOS data (virtually noiseless). A shot noise level should be added in Fig 15 to represent actual measured profiles, at roughly the same level than Fig 13. An example of the final observed transmittance can be seen in Fig 20. Text and caption have been adapted.

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