

## ***Interactive comment on “Detection of O<sub>4</sub> absorption around 328 nm and 419 nm in measured atmospheric absorption spectra” by Johannes Lampel et al.***

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### General Comments

Lampel and co-authors present evidence of oxygen O<sub>2</sub>-O<sub>2</sub> collision induced absorption bands at 328 and 419 nm from a combined analysis of Multi Axis (MAX) and Long Path (LP) Differential Optical Absorption Spectroscopy (DOAS) field measurements. The work presents analysis of the effects of these minor absorption bands on the retrieval of other absorbers (HCHO, BrO, H<sub>2</sub>O) in both MAX and LP-DOAS applications. The analysis utilizes high signal to noise retrievals to identify the band strengths in air to constrain interference with other fitted absorbers. This is especially true with re-

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gard to the application to satellite retrievals. The paper is well written and presents a compelling analysis that should be considered in trace gas measurements as well as motivate further laboratory studies to constrain these weak absorption bands. I recommend publication after a few minor corrections as noted below.

### Specific Comments:

The report of the cross-section value for the 419 nm band is only found in the Abstract, the estimate should also be included in the results. While the 419 nm band value in the analysis is definitely uncertain (a point well made by the authors), this should still be reported in the body of the paper.

### Technical Corrections:

Page 2 line 21: Missing reference (?? in parenthesis).

Page 2 line 23-24: The Vogel 2013 is referenced as the retrieval method for the earlier 2012 paper, is this correct?

Page 3 line 26: reword as “The spectrometer, an Acton 300i,”

Page 4 line 3: This paragraph needs some work (as follows:)

Page 14 line 31: “is obtained when ignoring . . .” (remove the first actually).

Page 15 line 1: molec2 cm-5 goes into the margin.

Page 15 line 11: resolved (one s).

Page 15 line 29: “was likely the O<sub>4</sub> absorption which . . .” Drop the first rather.