

## ***Interactive comment on “Auroral spectral estimation with wide-band color mosaic CCDs” by B. J. Jackel et al.***

**B. J. Jackel et al.**

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Reviewer #1 identifies several points which need to be clarified or corrected. We believe that we have addressed all of these points as described in more detail below.

Please also see the "diff" change-tracking PDF attached to the reply to reviewer 2.

1. Yes, the simultaneity issue should have been mentioned in the abstract. We have made several changes to the abstract including this addition “These devices provide sequences of two dimensional multi-spectral luminosity with simultaneous exposure of all color channels allowing inter-channel comparison even during periods with rapidly varying aurora.”

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2. Yes, specific examples would help illustrate temporal variations. A reworked paragraph now reads “Some auroral features, such as pre-midnight arcs, are essentially constant over intervals on the order of 10’s of minutes. Other phenomena, such as morning sector pulsating patches, have spatially stable luminosity structures that exhibit quasi-periodic fluctuations on time scales of 1-10 seconds. During extremely dynamic intervals, such as substorm onset, auroral luminosity can increase by several orders of magnitude in less than a minute. .”
3. Yes, an outline would be helpful. We have re-arranged the introduction and added the following text: “Subsequent sections contain a overview of low-cost color auroral imaging (§??), detailed spectral calibration of two commonly used color cameras (§??), a quantitative framework for spectral estimation applied to these two devices (§??), an examination of some possibilities for future instruments (§??), and a final discussion (§??).”
- 2,4, Line 2. Agreed, this statement was unnecessarily broad. Narrowed to “This drastically reduces total photon flux reaching the detector, often requiring the use of expensive image intensifier or electron multiplier technology to achieve acceptable levels of signal-to-noise for the short integration times required to resolve dynamic aurora.”
- 8, Line 17. Agreed, co-author has provided more content.
- 2, Line 20. Loss of information is only implicitly considered in later sections. Line removed.
- 1, Line 26. All valid points. Simplify by having 2 sets instead of three: “The issues that must be considered for field operation of a multiple camera system can be usefully assigned to two different groups. The first set includes issues that scale linearly with number of cameras  $N$  ie. two cameras will cost twice as much, occupy twice the space under the dome, and produce double the volume of data compared to a single camera. The second set consists of issues unique to a spectral synthesis system, such as common orientation, timing, and calibration.”

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3, Line 11. Agreed, “too” “many” “quotes”. Left in “raw” & “fast” modes but removed most others.

25, Line 4. Yes, fixed.

28, Line 9. Yes, fixed.

18, Line 1. Yes, fixed.

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Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 3, 753, 2013.