Johan Comparat <johan.comparat@gmail.com>

deep2 flux calibration comparison

7 messages

Johan Comparat <johan.comparat@uam.es> 16 juin 2015 16:34
À : Guangtun Zhu <guangtun.ben.zhu@gmail.com>, Jeffrey Newman <jeffrey.a.newman@gmail.com>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

Hi Jeff, Guangtun, Jean-Paul,

I implemented the flux calibration suggested by Jeff at the eBOSS meeting and I compared the two calibrations :
calibration 1 :
level_B=median(flux_Blue, last 100 good pixels)
level_R=median(flux_red, first 100 good pixels)
composite flux =
[flA_B * (0.5+level_R / (2.*levl_B)) , flA_R * (0.5+level_B / (2.*levl_R))]
calibrated flux = using the i band only

calibration 2 : (method suggested by Jeff)
qe correction for each pixel.
flux calibration using r - i interpolation

Results :
Measurements of emission lines below 7700A are in very good agreement. The LFs derived are in agreement with VVDS.
For lambda > 7700A, the method 2 provides line fluxes systematically higher than method1.

The [OII] LF derived with method 1 and 2 are consistent at redshift 0.95, but at redshift 1.2, the LF from method 2 is brighter than with method 1 that agrees with VVDS and the paper from Guangtun.

The different plots attached show this trend.

In particular, the method 2 induces a bump in emission line flux that is unphysical between redshift 1.05 and 1.2. With method 1 this does not exist.

Could one of you please make the same Luminosity_OII vs. redshift plot using your version of method 2 as a sanity check ?

Possible caveats:
I agree method 2 is supposedly more precise, but the results are puzzling.

I am suspecting a problem with the mag r-i interpolation to flux-calibrate.

Comparing the stacks at the same redshift and luminosity, there is something weird with calibration 2 as well (for the redder part of the lower redshift stack).

Action:
* I will keep calibration 1 as the fiducial one (it does work well in the end), unless I find what is wrong with 2.
* the blue down turn of the stacks in my presentation at eBOSS were due to a lack of spectra to be stacked. So by requiring to use at least 300 spectra for each pixel shown on the stack, it disappears.

What do you think ?

Best,
Johan
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9 pièces jointes

O2-luminosity-comparison.pdf
534K

O2-luminosity-cal2.pdf
279K

O2-flux-redshift.pdf
237K

LF-O2_3728_0.95-fc1.pdf
46K

LF-O2_3728_0.95-fc2.pdf
47K

LF-O2_3728_1.2-fc1.pdf
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LF-O2_3728_1.2-fc2.pdf
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O2-stack-z1-Lum42.pdf
15K

O2-stack-z12-Lum43.pdf
16K

Jeffrey Newman <jeffrey.a.newman@gmail.com> 16 juin 2015 17:17
À : Johan Comparat <johan.comparat@uam.es>
Cc : Guangtun Zhu <guangtun.ben.zhu@gmail.com>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

Hi Johan,

Are you sure you have the sense of the direction (multiplicative/divisive) correct for calibration 2?

We have strong evidence that there are jumps in 4000 angstrom break strength at the redshift when the break goes between bands that the DEEP2 flux calibration code solves (amongst other anomalies). My guess, then, is that your implementation doesn't match the original. Perhaps send me a file and we can compare the calibrated results?

Best,

Jeff

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<LF-O2_3728_0.95-fc2.pdf><LF-O2_3728_1.2-fc1.pdf><LF-O2_3728_1.2-fc2.pdf><O2-stack-z1-Lum42.pdf>
<O2-stack-z12-Lum43.pdf>

Jeffrey Newman U. Pittsburgh Dept. of Physics & Astronomy
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Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com> 17 juin 2015 20:06
À : Johan Comparat <johan.comparat@uam.es>

Hi Johan,

I am traveling at the moment and will get back to you as soon as I find time.

Thanks
Guangtun

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Guangtun Ben Zhu, Hubble Fellow, http://www.pha.jhu.edu/~gz323

Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com> 19 juin 2015 13:34
À : Jeffrey Newman <jeffrey.a.newman@gmail.com>
Cc : Johan Comparat <johan.comparat@uam.es>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

Hi Johan,

- Are 'calibration 1' and 'calibration 2' swapped in the last figure?
- I feel there is no physical reason why there should be a jump at redshift 1.1, so the jump must be due to flux calibration difference between the two spectrographs.
- How did you do the R-I interpolation in the method 2? Note [O II] is in I band so the continuum level would be slightly higher if you didn't subtract the [O II] emission contribution in the broadband photometry.
- Instead of comparing composite spectra based on two calibrations, if you plot the composites based on calibration 2 but in different narrow redshift bins (0.95<z<1.00 vs. 1.15<z<1.20) and mark the gap (~7700 A in observer frame), you might be able to see if there is a jump at the gap.

Though, in any case, I don't see much of value in putting more of your time into this investigation. Method 1 seems to be accurate enough to me for the purpose of [O II] LF.

Thanks
Guangtun

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Guangtun Ben Zhu, Hubble Fellow, http://www.pha.jhu.edu/~gz323

Jeffrey Newman <jeffrey.a.newman@gmail.com> 19 juin 2015 13:55
À : Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com>
Cc : Johan Comparat <johan.comparat@uam.es>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

Hi Guangtun,

On Jun 19, 2015, at 4:34 PM, Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com> wrote:

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There aren't two spectrographs, but rather two chips that each spectrum crosses. In the private DEEP2 flux calibration, we correct for the differences in QE curves amongst the chips, as well as spectrograph, etc. z=1.1 is right where the chip gap occurs, on average.

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I'm assuming you know this, but just in case: CFHT 12K R and I are somewhat different than standard r and i. I in particular is more like halfway between SDSS i and z. The DEEP2 calibration integrates the spectrum over the filter curve of a given band, so if [OII] is in the window, it calibrates out properly.

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The chip gap is 7800 AA.

Best,

Jeff

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Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com> 19 juin 2015 14:07
À : Jeffrey Newman <jeffrey.a.newman@gmail.com>
Cc : Johan Comparat <johan.comparat@uam.es>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

Hi Jeff,

On Fri, Jun 19, 2015 at 4:55 PM, Jeffrey Newman <jeffrey.a.newman@gmail.com> wrote:

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Yes, thanks for the clarification! I should've be more clear about this, the comment stands though.

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Yes, I knew, but I guess I was (am) not sure if Johan's implementation is an integration or just a median flux at an effective wavelength (Johan?)

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> The chip gap is 7800 AA.

I believe it actually varies between 7700 and 7900 A (?), which is why I suggested the two redshift bins away from z=1.1.

Thanks
Guangtun

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Jeffrey Newman <jeffrey.a.newman@gmail.com> 19 juin 2015 14:29
À : Guangtun Ben Zhu <guangtun.ben.zhu@gmail.com>
Cc : Johan Comparat <johan.comparat@uam.es>, Jean-Paul Kneib <jean-paul.kneib@epfl.ch>

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> Yes, thanks for the clarification! I should've be more clear about this, the comment stands though.

And to reiterate: my suspicion is that Johan is dividing when he should be multiplying, or something along those lines, so that the effect isn't going away (or there's some other difference in e.g. array conventions between Python and IDL which is causing the translation of the IDL code to go awry).

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Yes, that's pretty close to correct — see Fig 20 of the DEEP2 survey paper.

Best,

Jeff
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