

LYRA Responsivity Measurements: BESSY NI March 2007 Updates

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The following table shows the wavelength intervals (in *nm*) for various channels and tests (first column): The BESSY NI and GI campaigns of March 2006 (second column; dotted black lines in the figures below) have lead to the selection of intervals for the radiometric model (third column; straight black lines in figures). The BESSY NI campaign of February 2007 (fourth column; red dashed lines in figures) now calls for some new decisions.

channel	measured 2006	selected 2006	measured 2007	selected 2007
1-1 NI	112.5-310.0	112.5-226.0	112.5-240.0	112.5-240.0
1-2 NI	112.5-240.0	156.0-240.0	172.0-240.0	172.0-240.0
1-3 GI	1.0- 30.0	1.0- 26.7		1.0- 26.7--
1-3 NI	42.0-110.0	42.0- 84.0	36.0- 64.0	--36.0- 84.0
1-4 GI	1.0- 30.0	1.0- 30.0		1.0- 21.1
2-1 NI	112.5-310.0	112.5-226.0	112.5-240.0	112.5-240.0
2-2 NI	112.5-240.0	156.0-240.0	170.0-240.0	170.0-240.0
2-3 GI	1.0- 30.0	1.0- 26.7		1.0- 26.7--
2-3 NI	42.0-110.0	42.0- 84.0	36.0- 64.0	--36.0- 84.0
2-4 GI	1.0- 30.0	1.0- 30.0		1.0- 23.7
3-1 NI	112.5-310.0	112.5-286.0	112.5-240.0	112.5-240.0
3-2 NI	112.5-240.0	156.0-240.0	170.0-240.0	170.0-240.0
3-3 GI	1.0- 30.0	1.0- 26.7		1.0- 26.7--
3-3 NI	42.0-110.0	42.0- 84.0	36.0- 64.0	--36.0- 84.0
3-4 GI	1.0- 30.0	1.0- 30.0		1.0- 21.1

A decision had to be made as of which responsivity measurements should be selected for the radiometric model and its future simulations. Based on earlier decisions as well as considerations about significance and uncertainty, I suggest the values in the fifth column (above). This includes:

- (1) Cutting the Lyman channel intervals above 240 nm, instead of 226 or 286 nm.
- (2) Cutting the Herzberg channel intervals below ~170 nm instead of 156 nm (several 2006 responsivity measurements below 156 nm were negative).
- (3) Cutting the GI parts of the Aluminium channel intervals at 26.7 nm, i.e. discarding the 30 nm measurements as unreliable.
- (4) Assuming the new (2007 NI campaign) Aluminium channel measurements at 36, 38, and 40 nm as reliable.
- (5) Assuming also to consider the additional "fine resolution" data set for Aluminium channel 2-3 (2007 NI campaign) by averaging the two measurements.
- (6) Assuming a linear interpolation instead of a step function between 26.7 and 36 nm (limits of the GI and NI campaign for the Aluminium channels).
- (7) Cutting the NI part of the Aluminium channel intervals at 84 nm, but filling up the interval between 64 and 84 nm with measurements from 2006.
- (8) Averaging the double measurements at 1.42 and 1.60 nm (2006 GI campaign, for Aluminium and Zirconium channel).
- (9) Leaving the Zirconium channel intervals otherwise as they were, between 1 and ~21 nm (several responsivity

measurements between ~21 and 30 nm are zero).

(10) Additionally, as an option, extend the interval into the near UV, visible, and IR spectrum, i.e. up to 1100 or 1240 nm, with the help of the separate filter and detector measurements used for the first radiometric model.

[Next steps will be: (a) Re-calculate responsivity-reducing factor due to small beam at center, with new beam sizes and new flatfields, (b) re-calculate radiometric model, purities etc., (c) additionally, test extended intervals, evaluate differences, (d) re-calculate calibration software]





