

UNIVERSITAT POLITÈCNICA DE CATALUNYA

DEPARTAMENT DE ÒPTICA I OPTOMETRIA



**Departament de Ciència
i Enginyeria Nàutiques**

UNIVERSITAT POLITÈCNICA DE CATALUNYA

**Thorough characterization and
analysis of a multispectral
imaging system developed for
colour measurement**

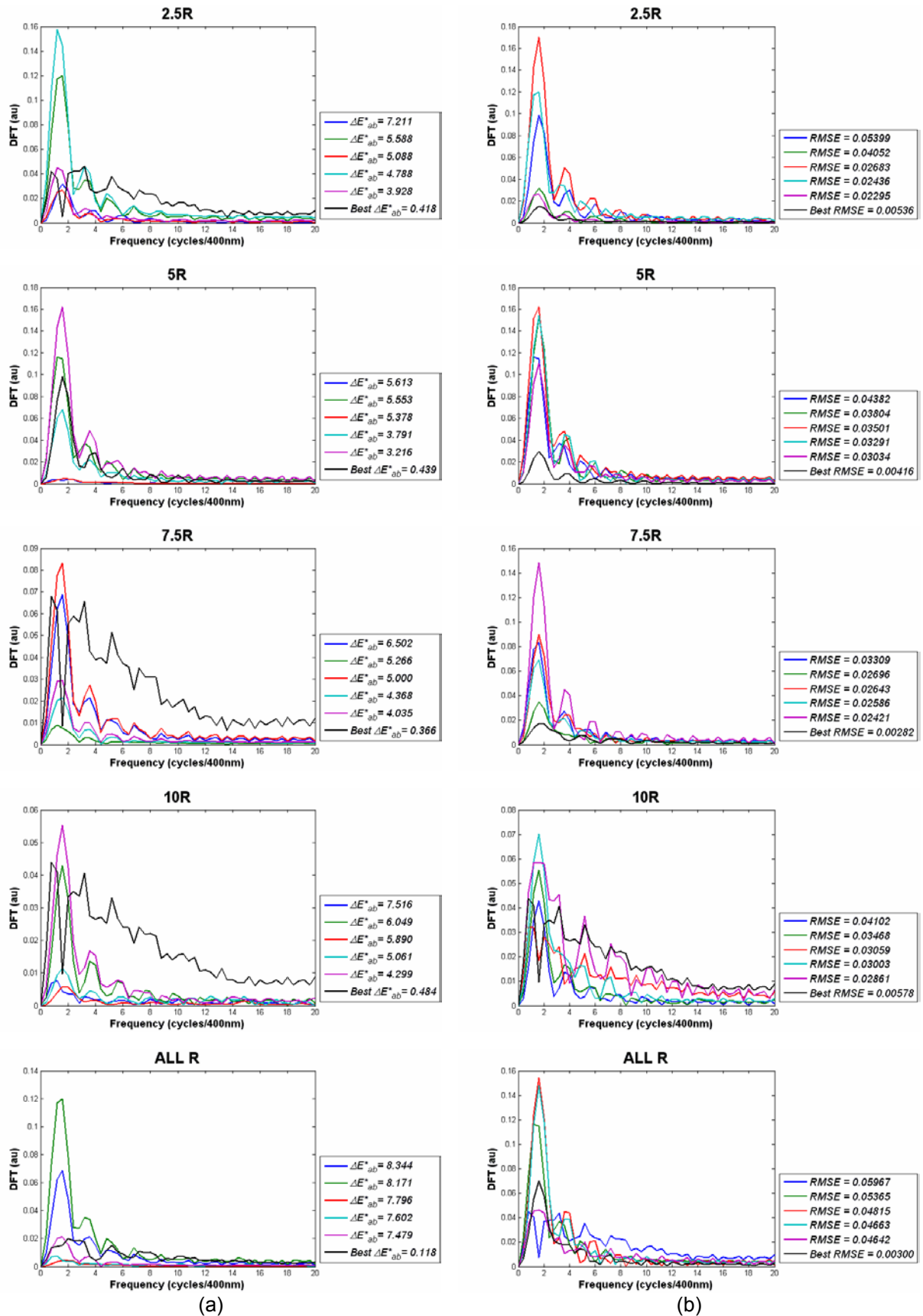
Thesis

Student: Marta De Lasarte Rigueiro

Appendix 7

A7.1 Amplitude of the DFT's components of the colour patches having the five worst and the best ΔE^*_{ab} and RMSE values

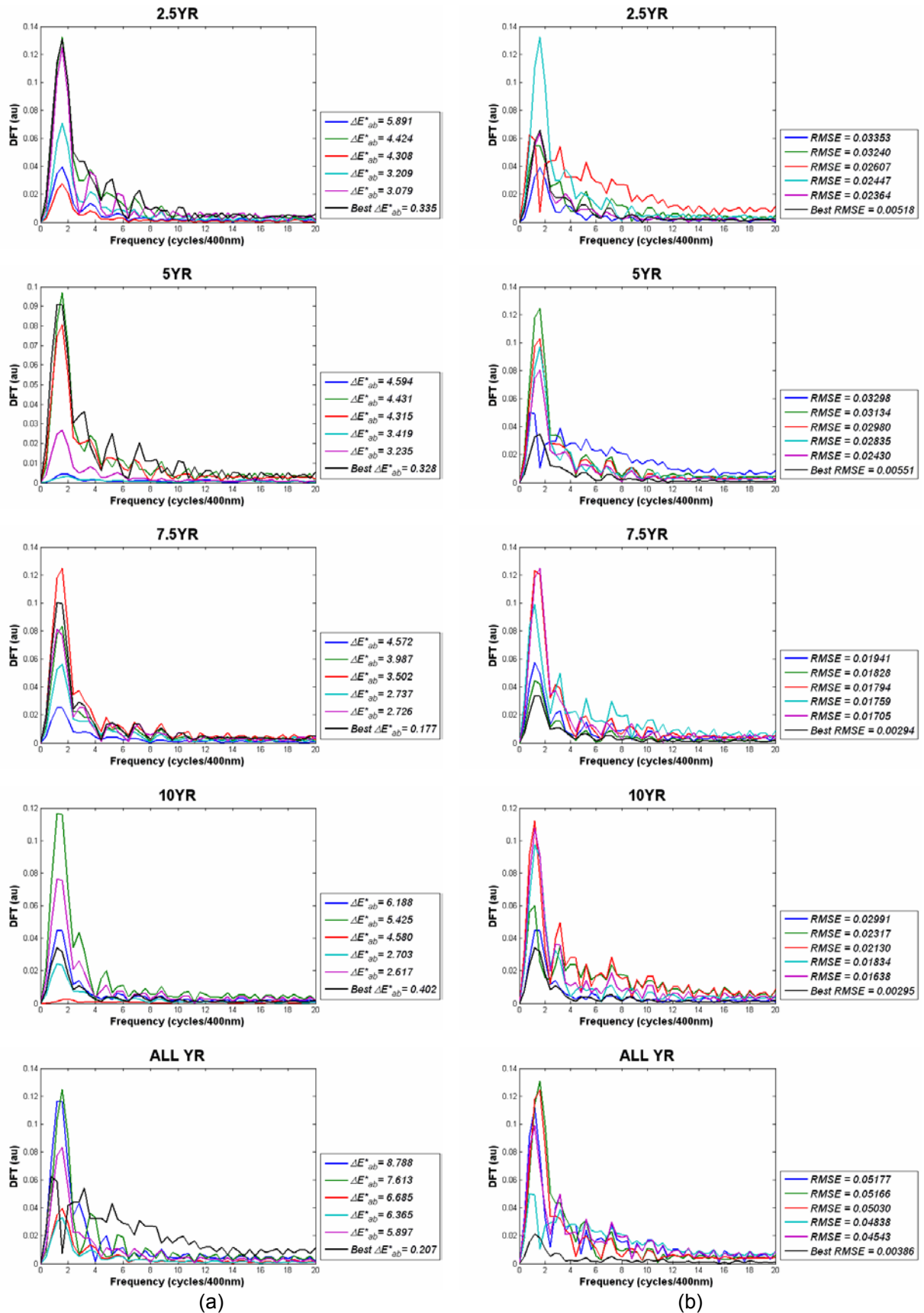
Figure A7.1 (1) *MUNSELL R*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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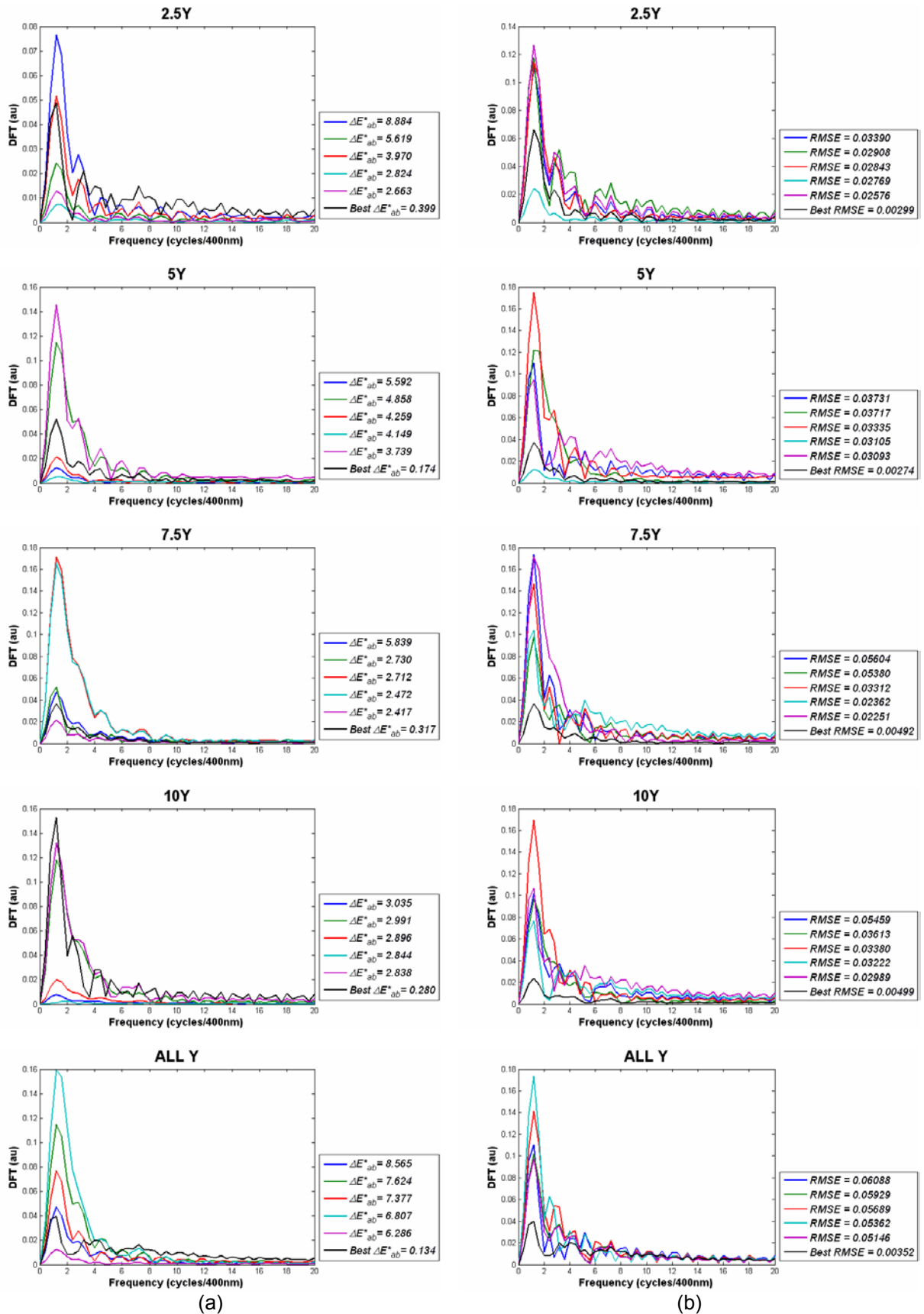
Figure A7.1 (2) *MUNSELL YR*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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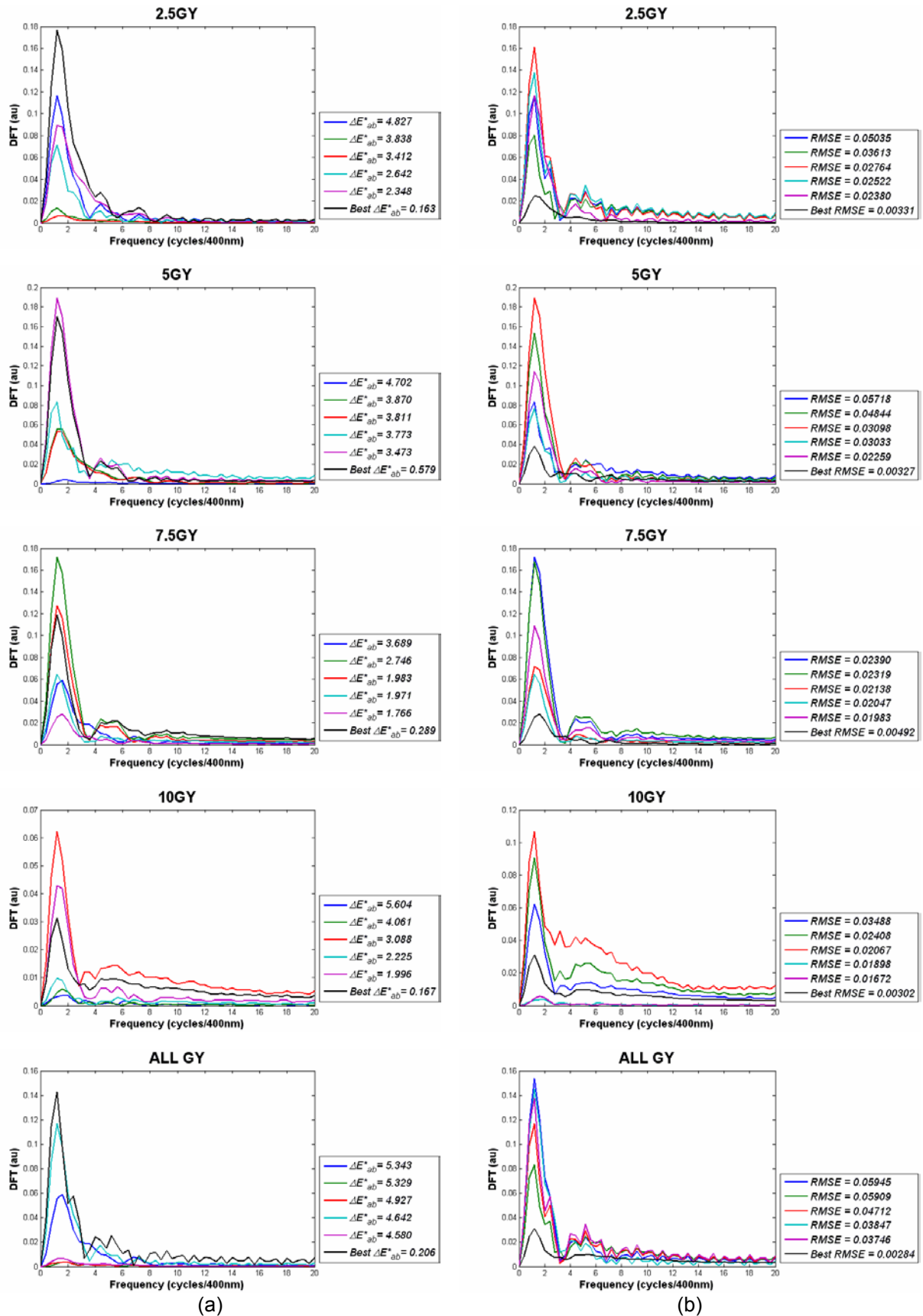
Figure A7.1 (3) *MUNSELL Y*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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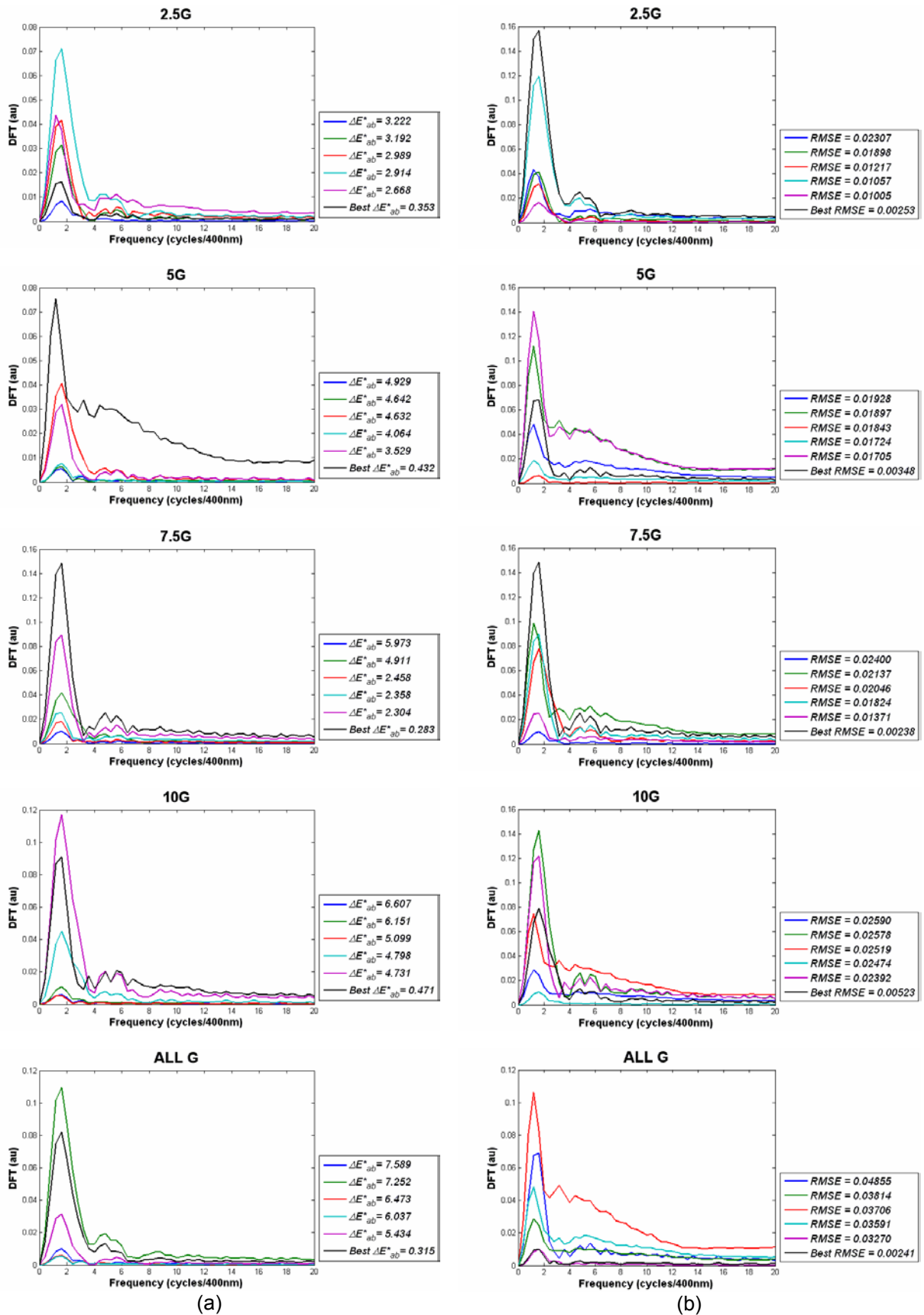
Figure A7.1 (4) *MUNSELL GY*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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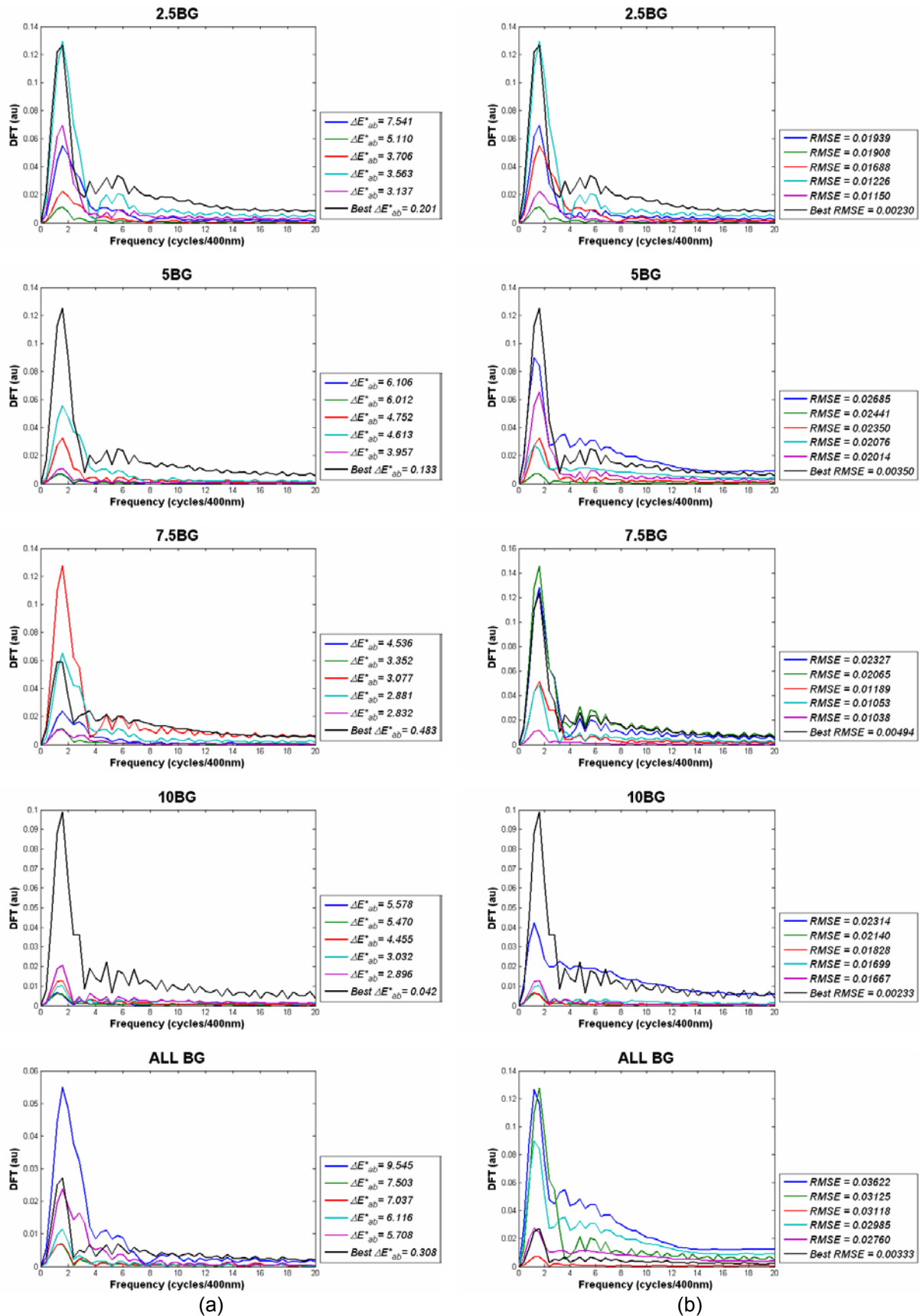
Figure A7.1 (5) **MUNSELL G**: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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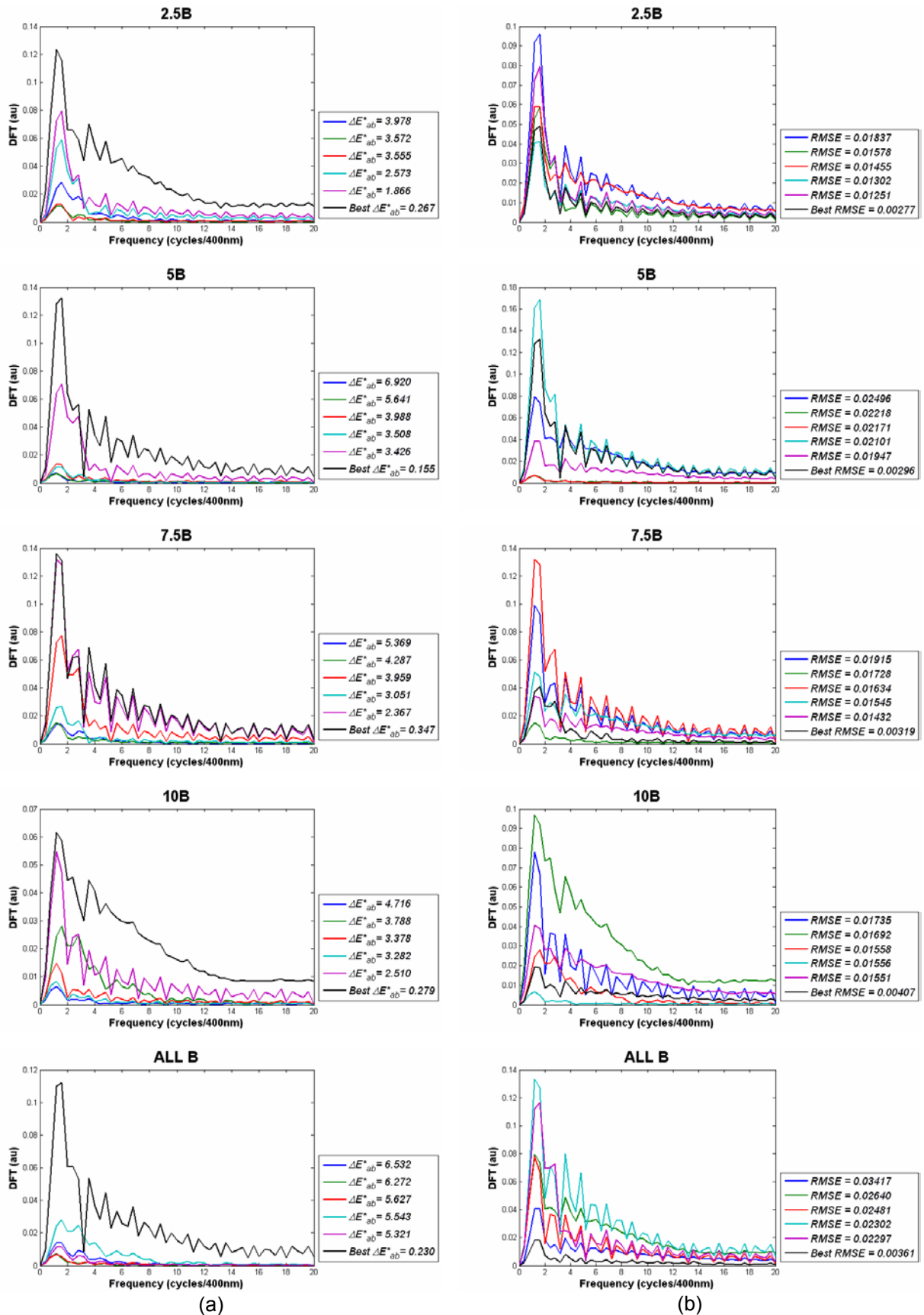
Figure A7.1 (6) *MUNSELL BG*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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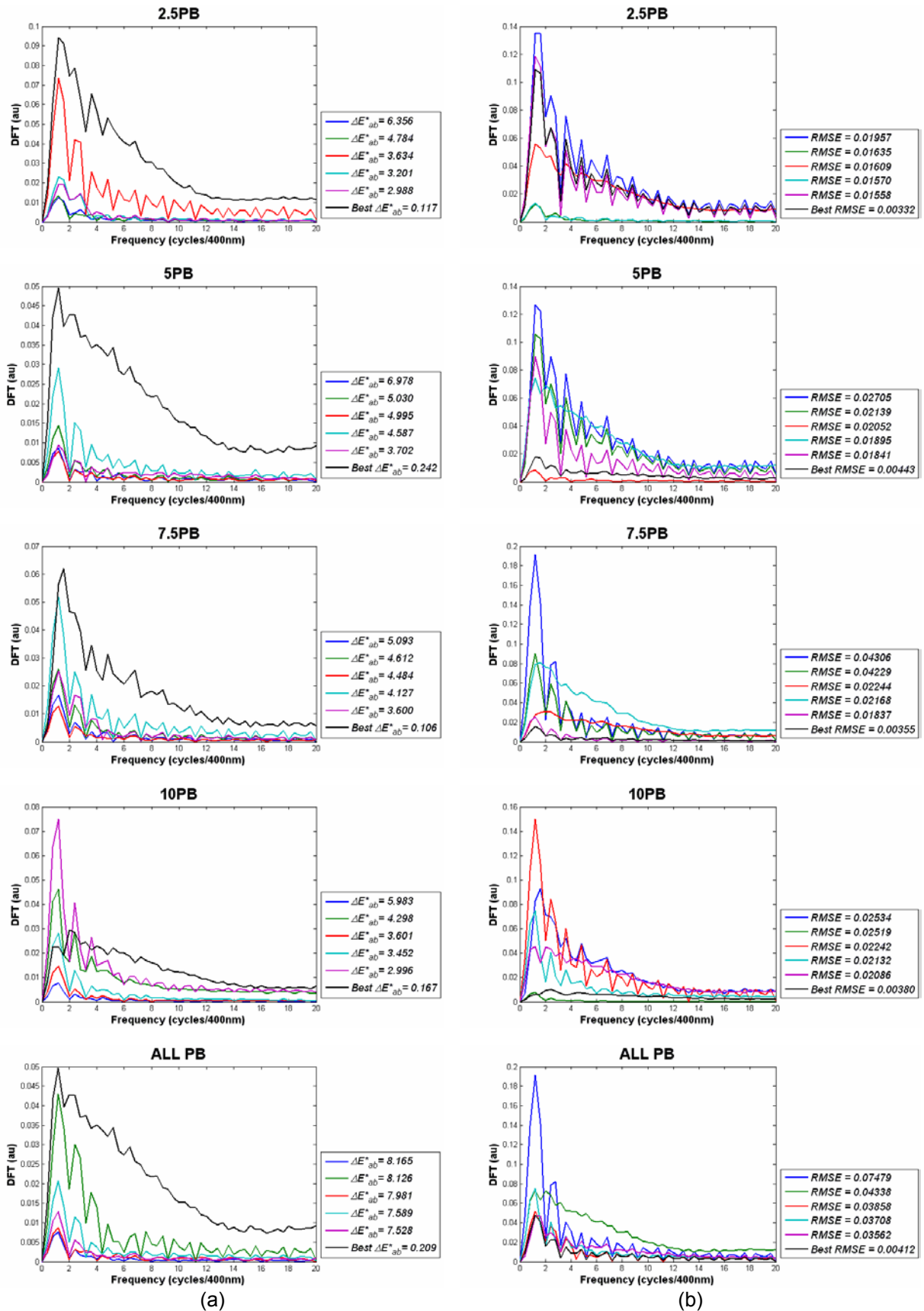
Figure A7.1 (7) **MUNSELL B**: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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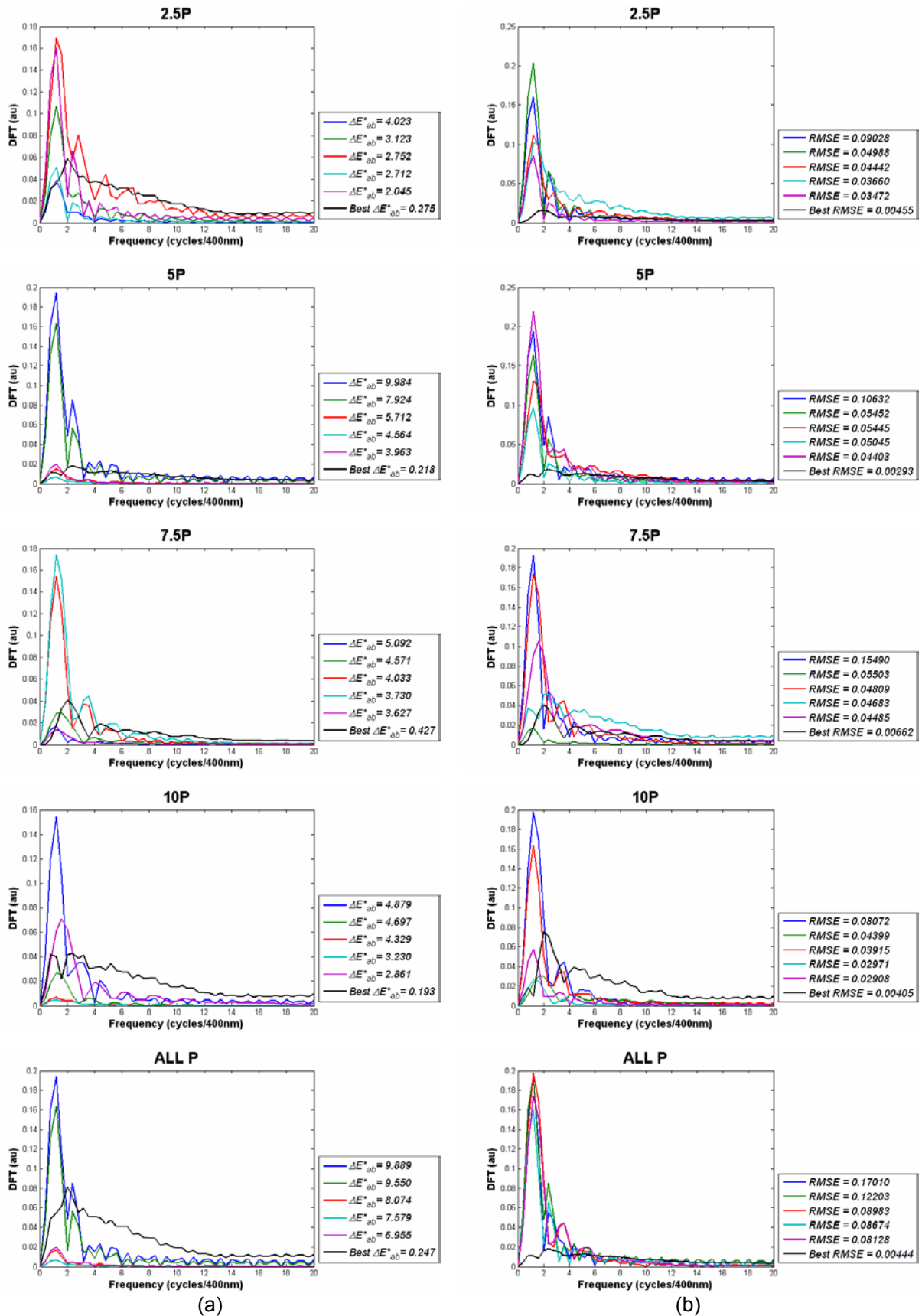
Figure A7.1 (8) *MUNSELL PB*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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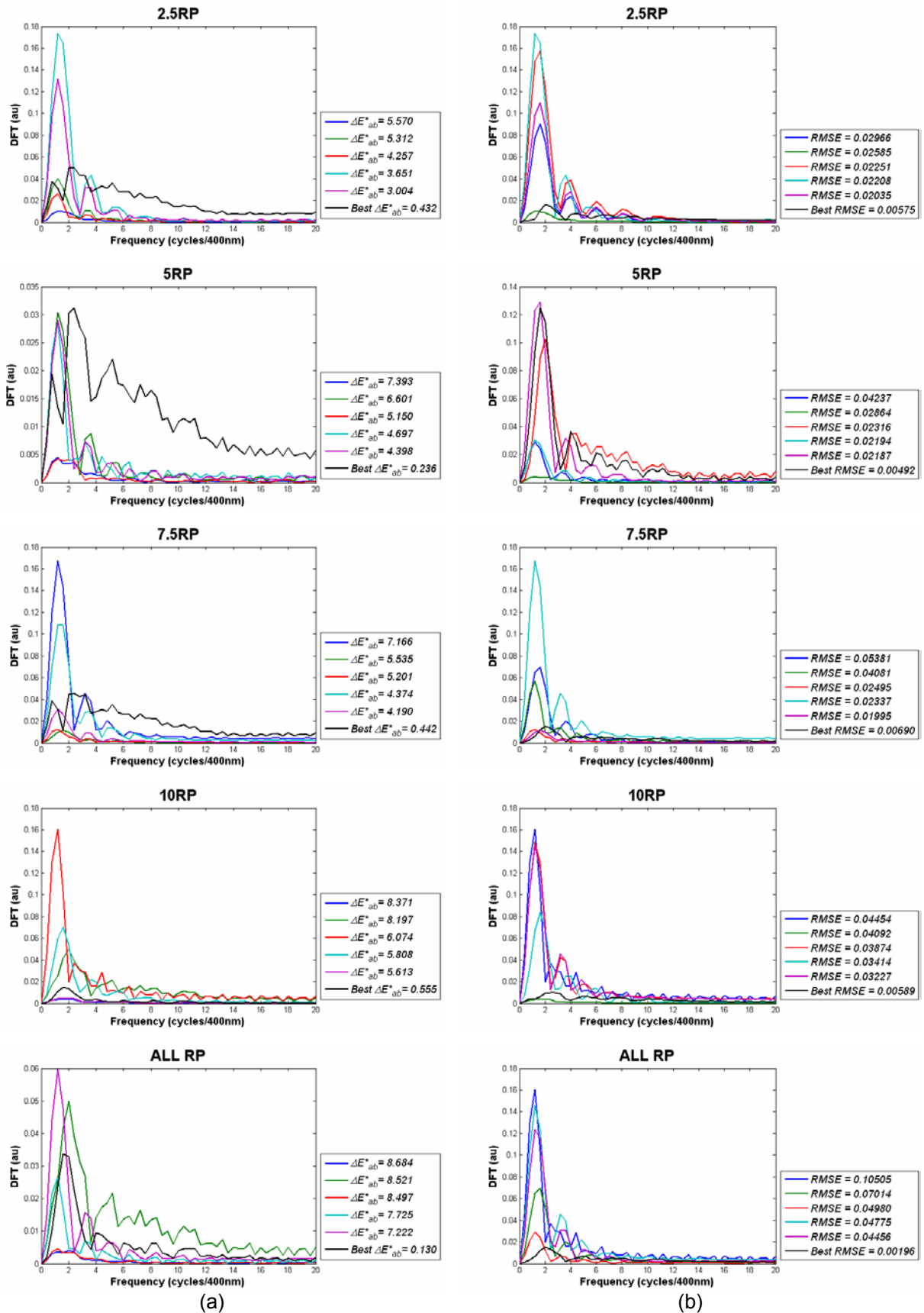
Figure A7.1 (9) *MUNSELL P*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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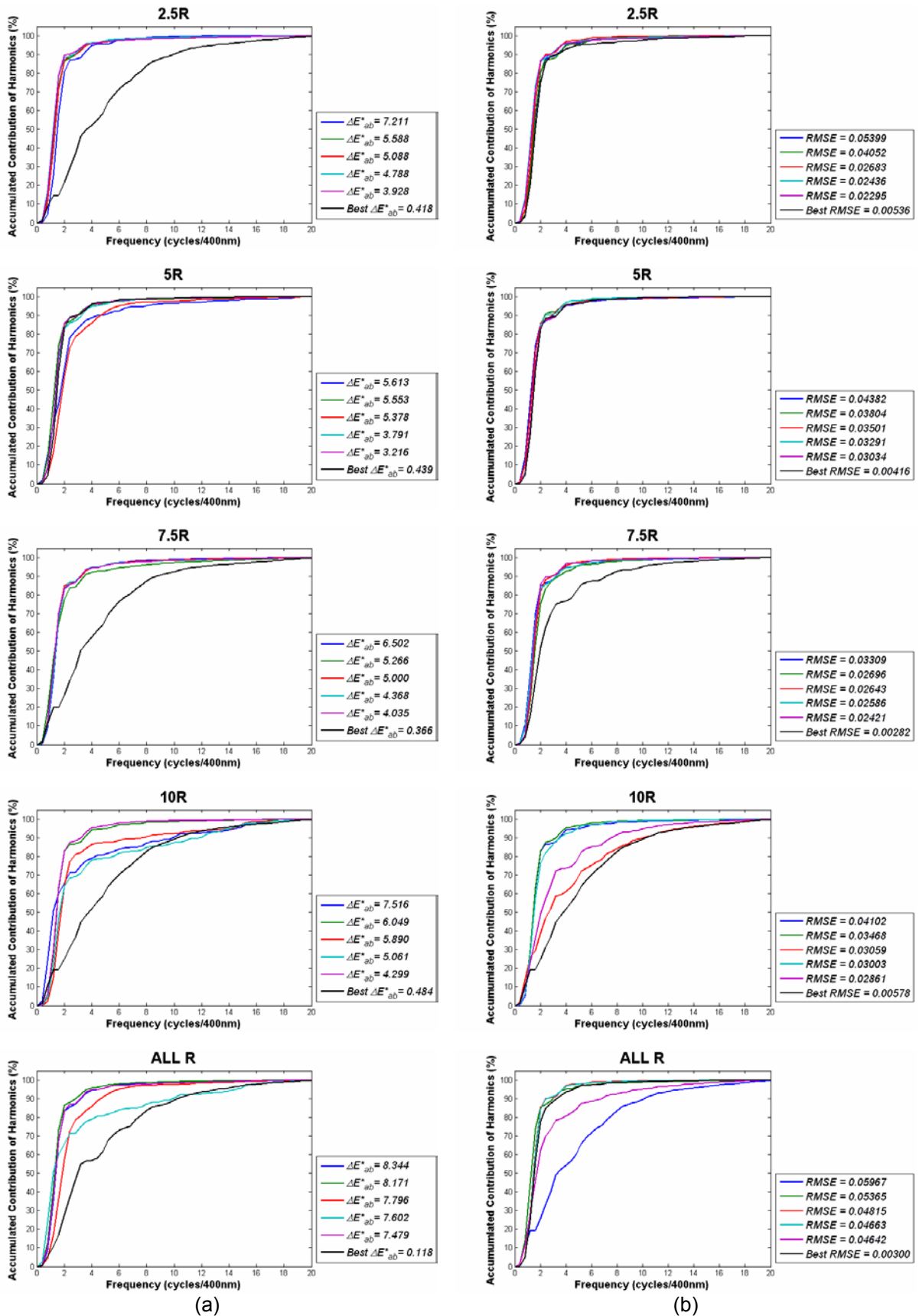
Figure A7.1 (10) *MUNSELL RP*: Amplitude of the DFT's components of the colour patches with the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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A7.2 Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best ΔE^*_{ab} and RMSE values

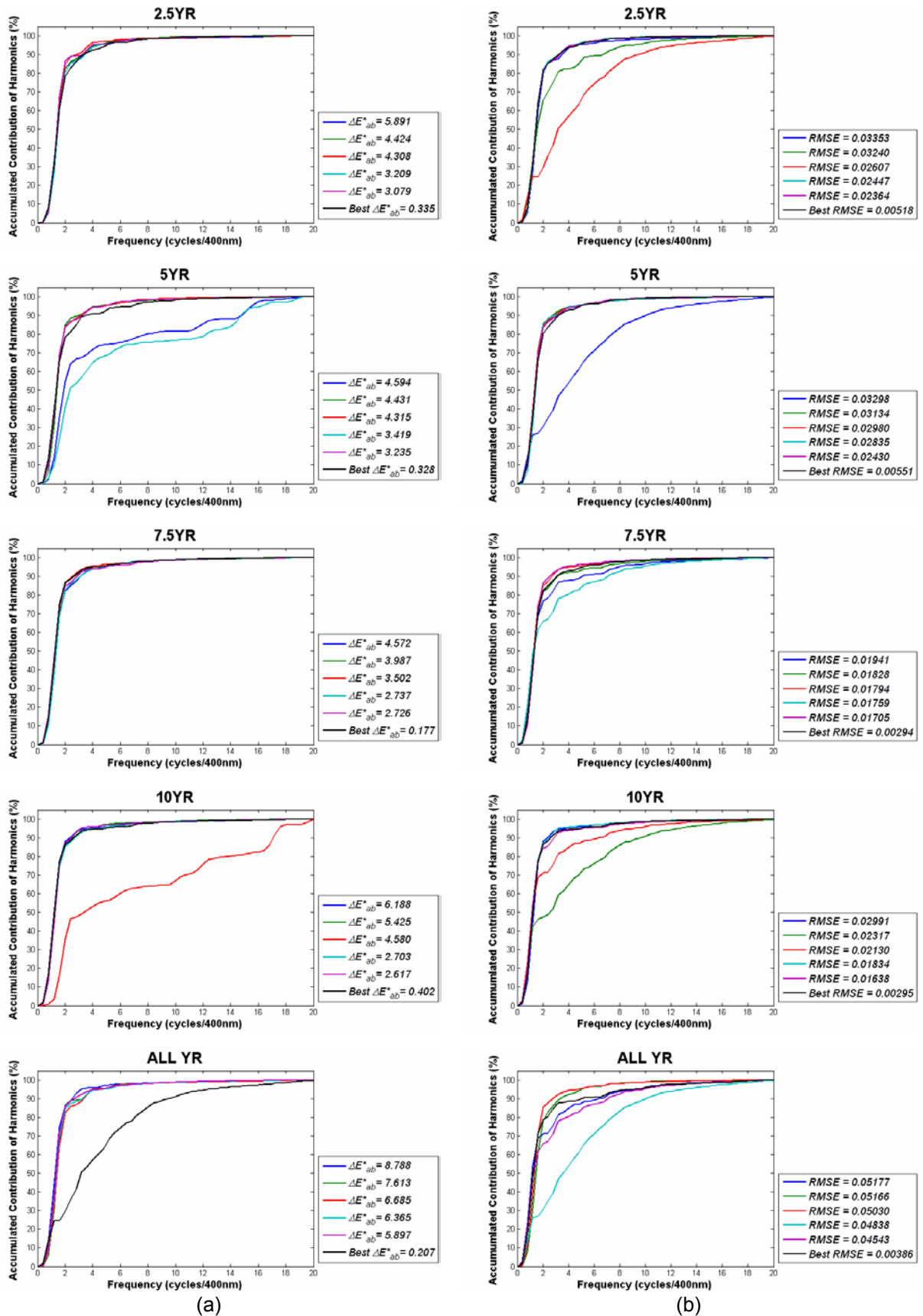
Figure A7.2 (1) *MUNSELL R*: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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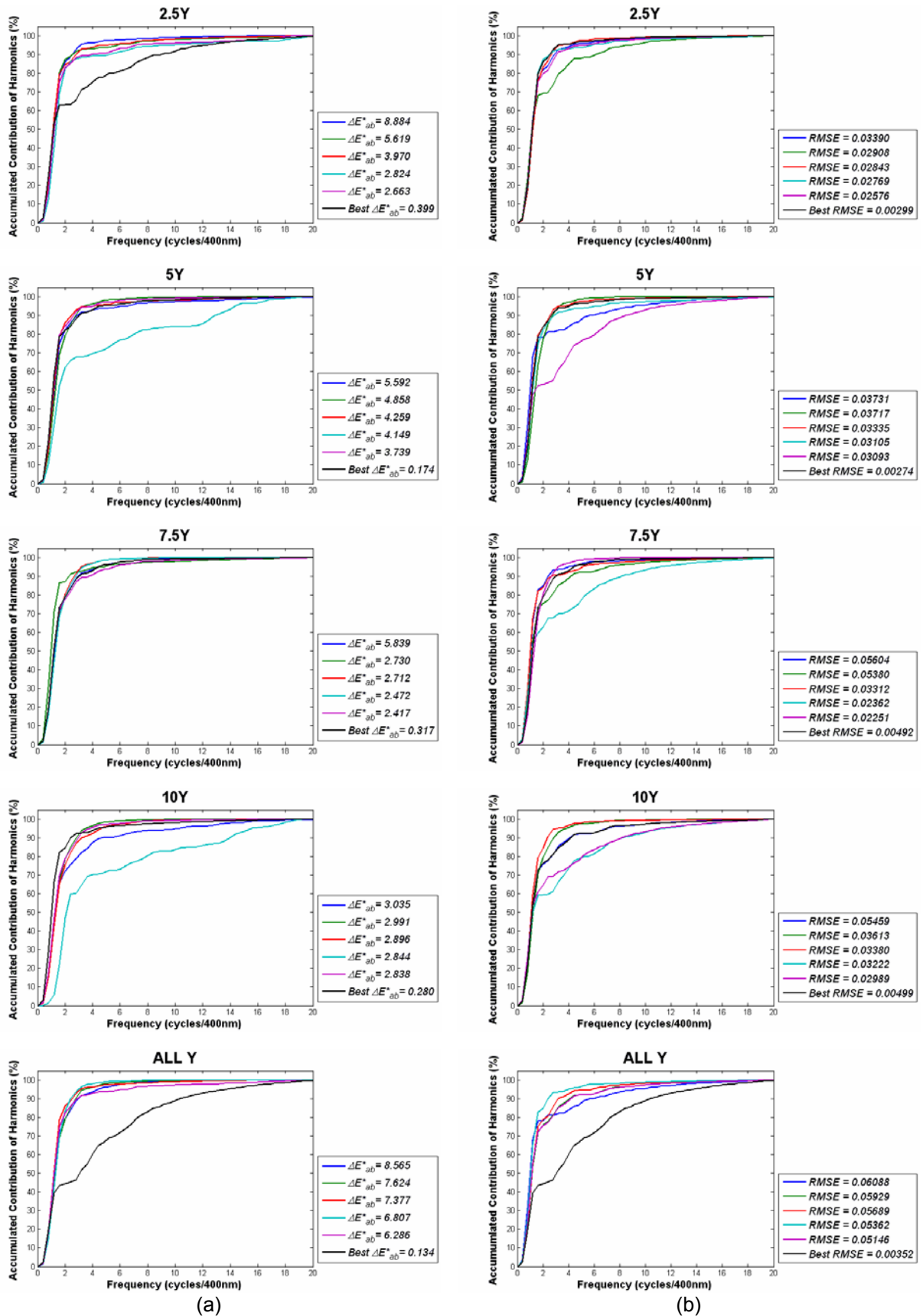
Figure A7.2 (2) *MUNSELL YR*: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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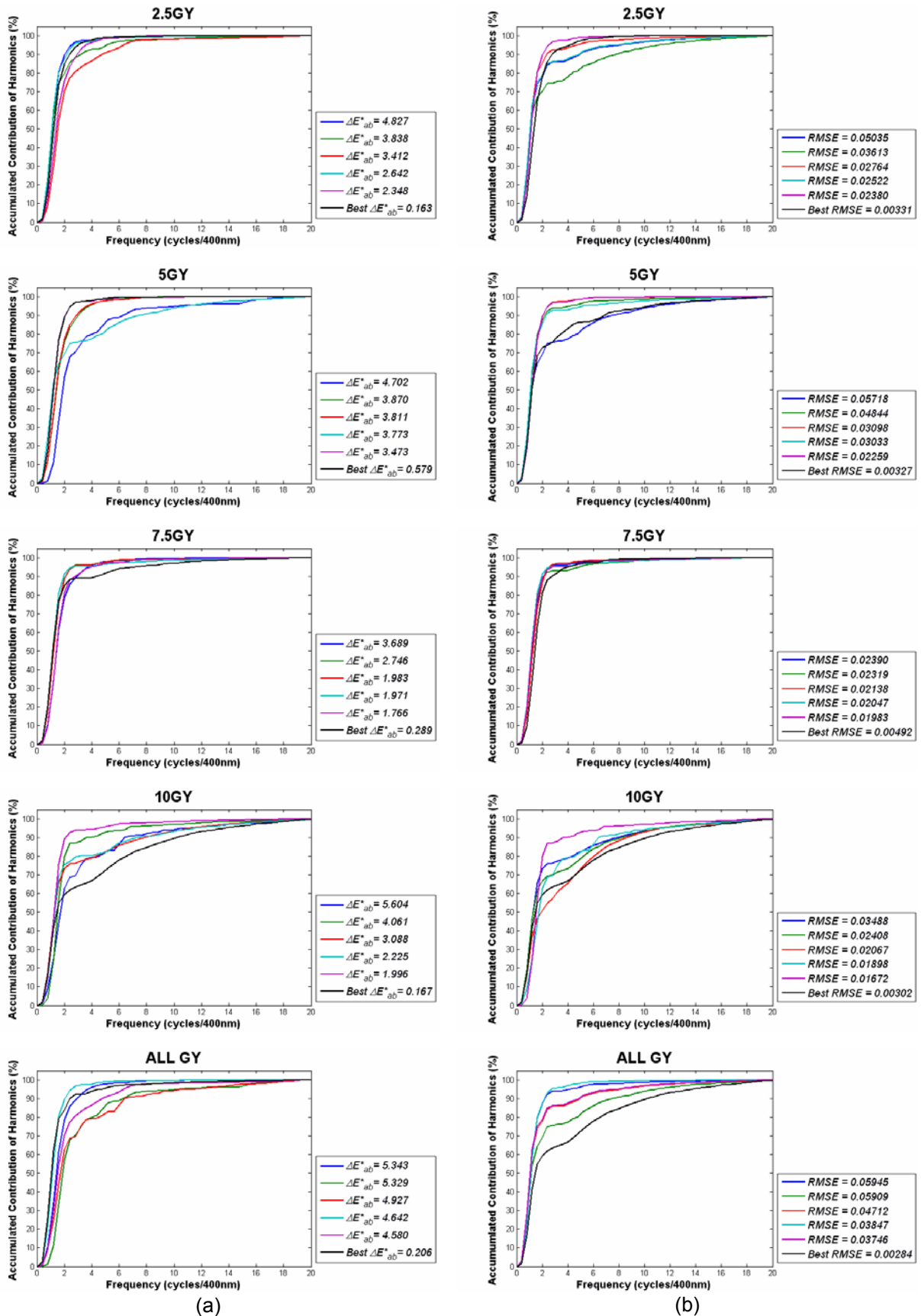
Figure A7.2 (3) *MUNSELL Y*: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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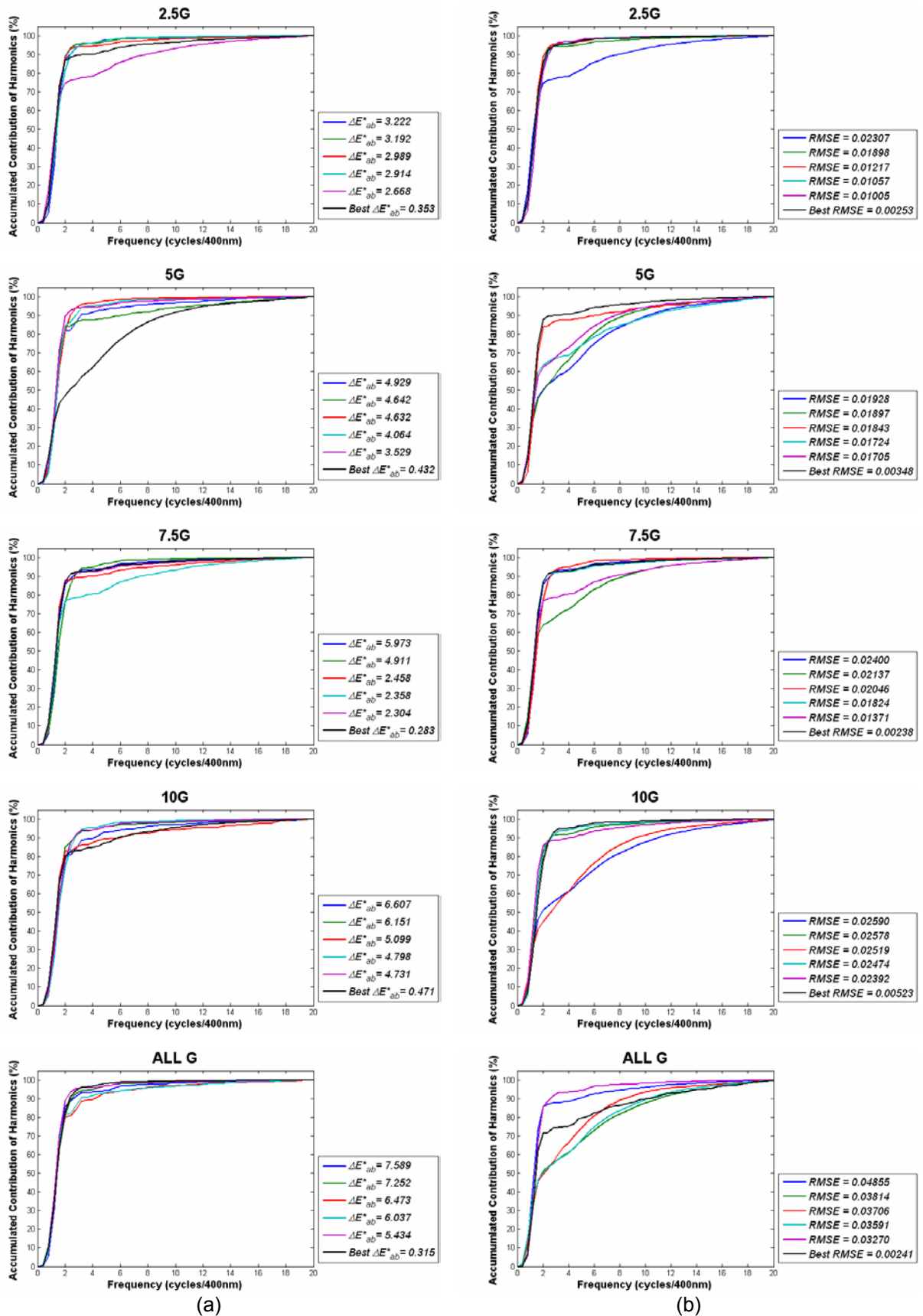
Figure A7.2 (4) **MUNSELL GY**: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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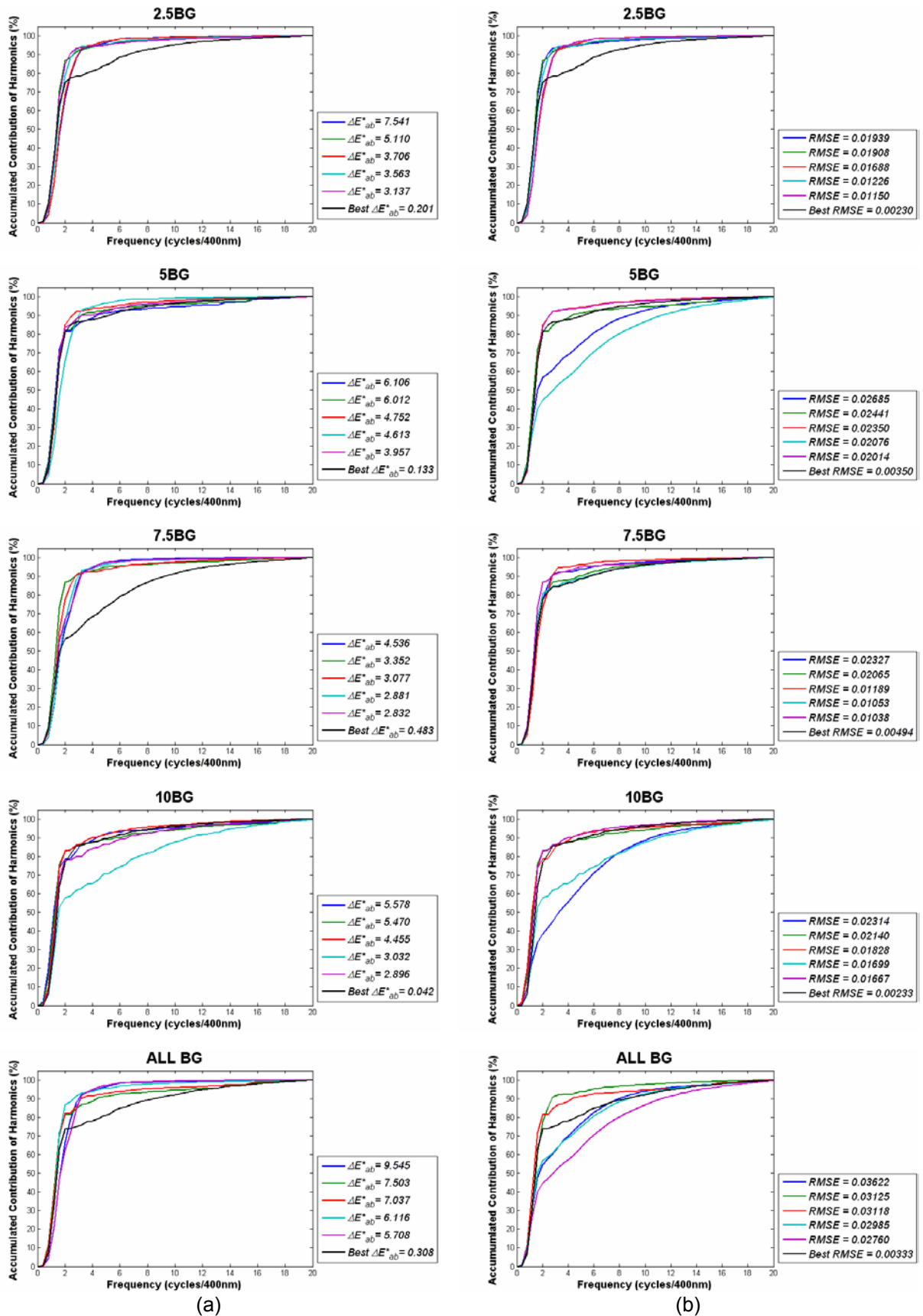
Figure A7.2 (5) **MUNSELL G**: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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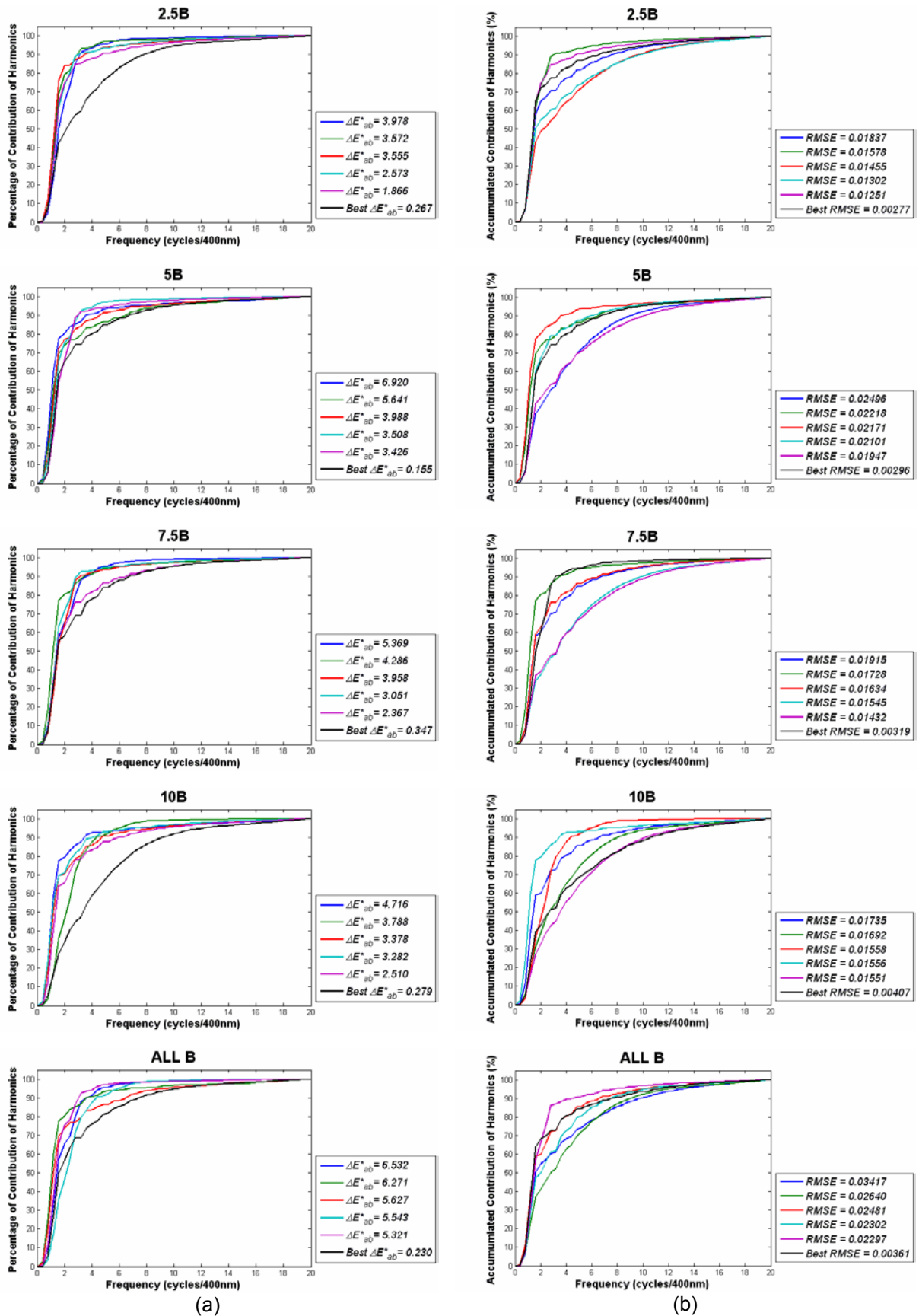
Figure A7.2 (6) **MUNSELL BG**: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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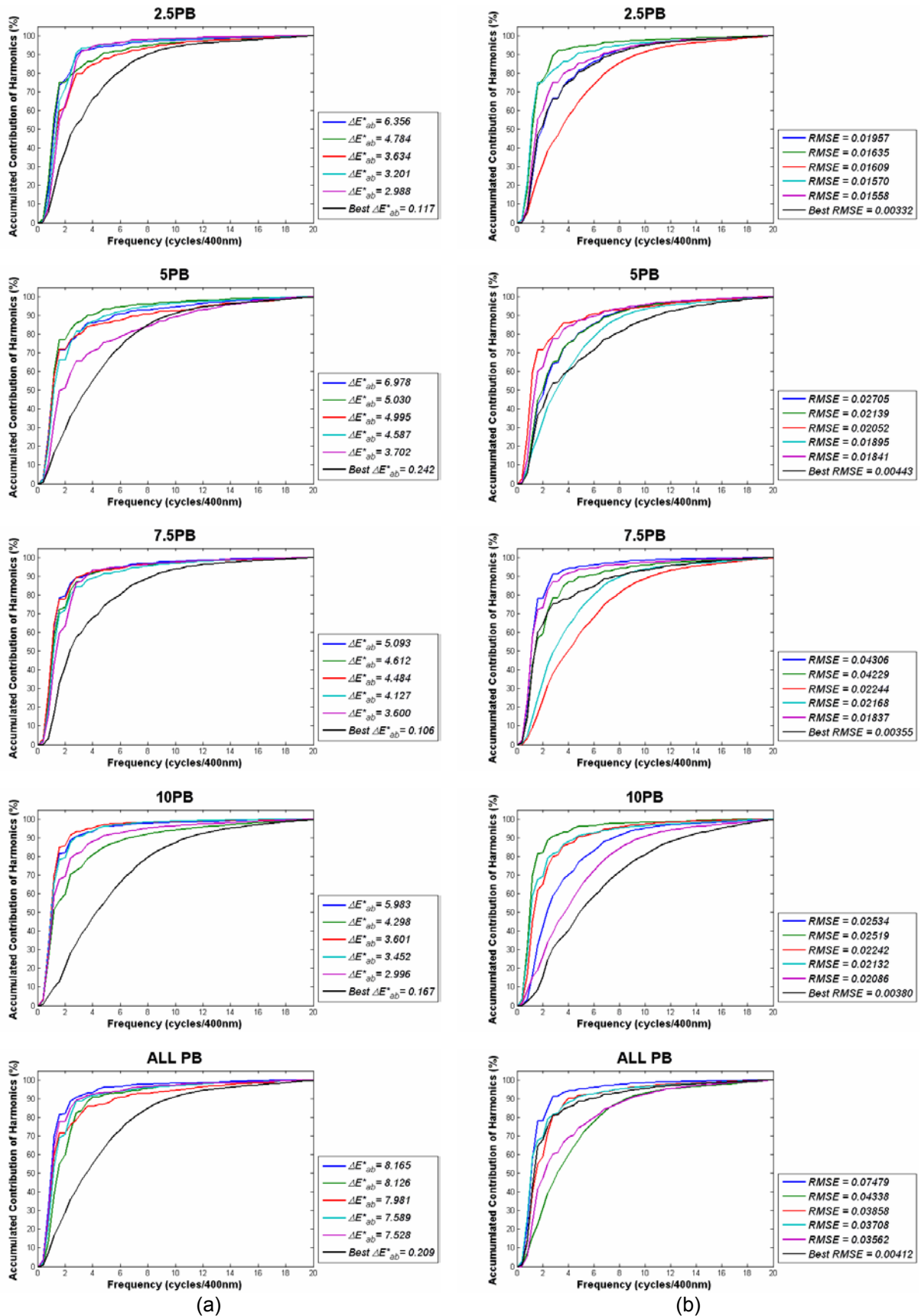
Figure A7.2 (7) **MUNSELL B**: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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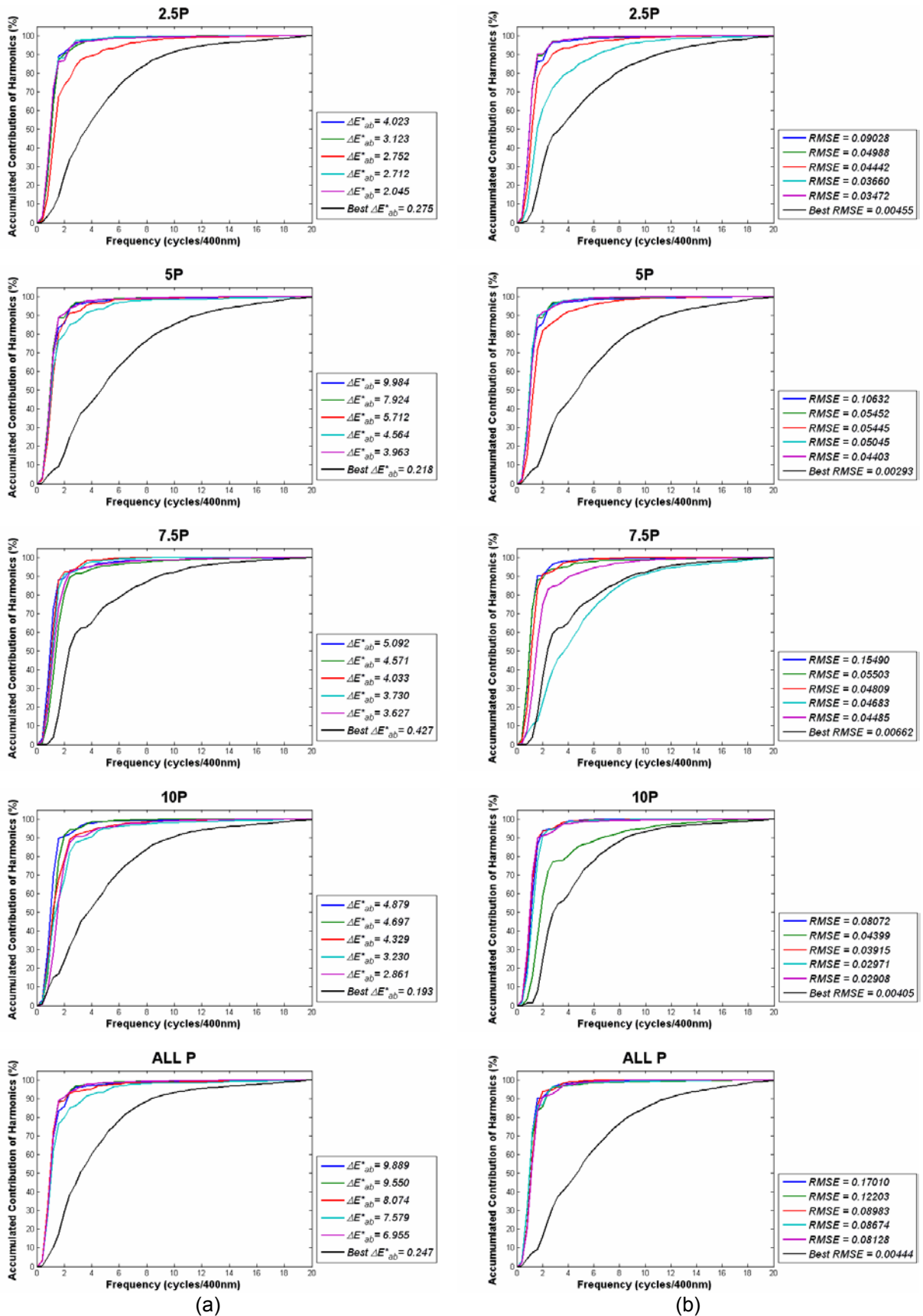
Figure A7.2 (8) **MUNSELL PB**: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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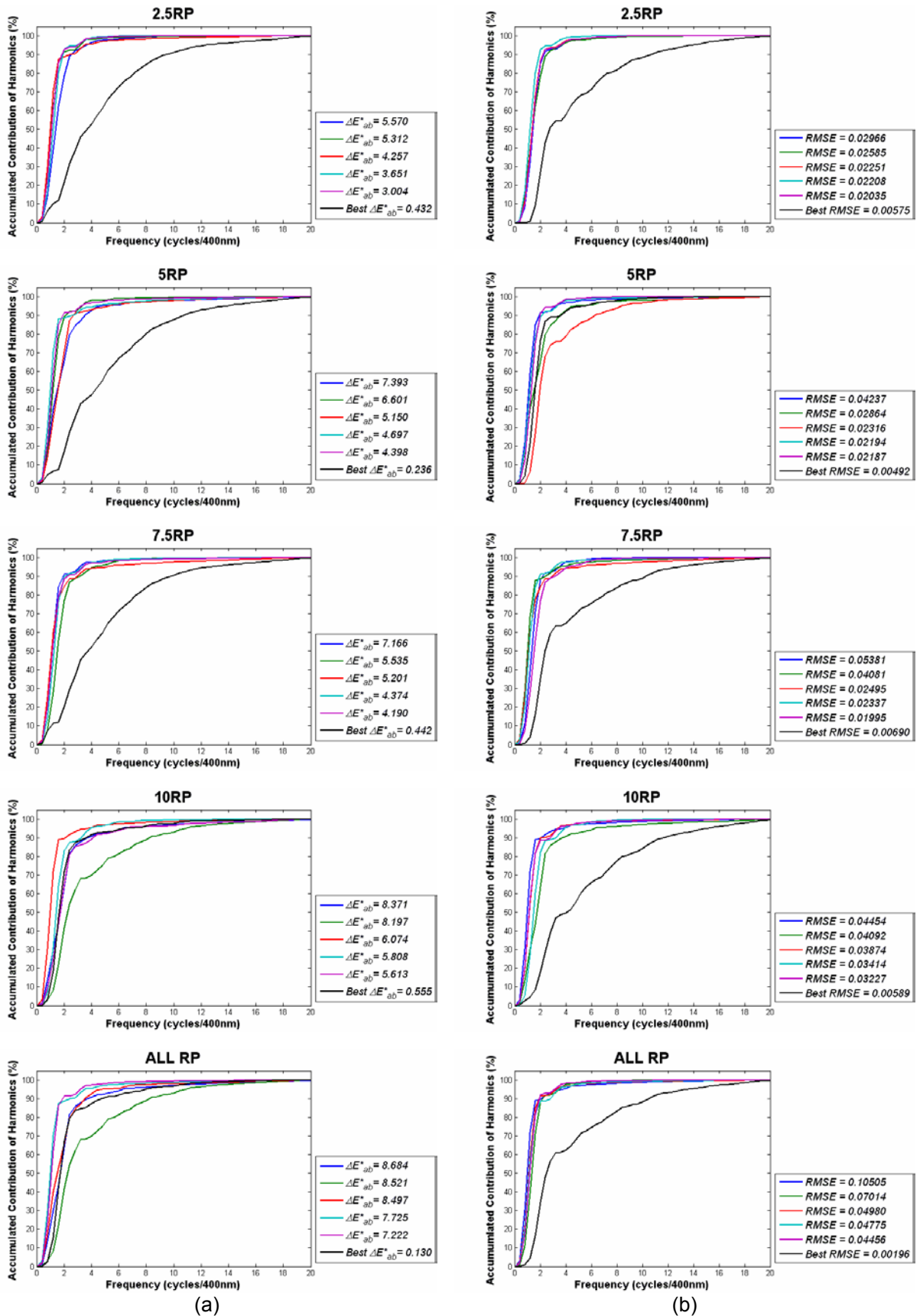
Figure A7.2 (9) *MUNSELL P*: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



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Figure A7.2 (10) *MUNSELL RP*: Accumulated contribution of the DFT's harmonics for the colour patches having the five worst and the best (a) ΔE^*_{ab} and (b) RMSE values.



**Appendix 8 Database of selected commercially available interference filters
(Edmund Optics, OptoSigma, CVI Laser Laser)**

Central Wavelength (nm)	FWHM (nm)	Peak Transmittance (%)	Supplier
400	10	40	<i>OptoSigma</i>
400	40	40	<i>OptoSigma</i>
400	50	55	<i>Edmund Optics Optics</i>
400	40	35	<i>CVI Laser Laser</i>
400	70	55	<i>CVI Laser Laser</i>
405	10	40	<i>Edmund Optics</i>
410	10	40	<i>Edmund Optics</i>
410	10	35	<i>CVI Laser Laser</i>
415	10	40	<i>Edmund Optics</i>
415	10	35	<i>CVI Laser</i>
420	10	40	<i>Edmund Optics / CVI Laser</i>
430	10	40	<i>Edmund Optics / CVI Laser</i>
430	10	35	<i>CVI Laser</i>
436	10	40	<i>Edmund Optics</i>
440	10	40	<i>CVI Laser</i>
442	10	40	<i>Edmund Optics</i>
450	10	45	<i>Edmund Optics / OptoSigma / CVI Laser</i>
450	40	50	<i>OptoSigma</i>
450	80	60	<i>Edmund Optics</i>
450	10	40	<i>CVI Laser</i>
450	25	45	<i>CVI Laser</i>
450	40	45	<i>CVI Laser</i>
450	70	55	<i>CVI Laser</i>
455	10	45	<i>Edmund Optics</i>
458	10	45	<i>Edmund Optics</i>
460	10	45	<i>CVI Laser</i>
467	10	45	<i>Edmund Optics</i>
470	10	45	<i>Edmund Optics / CVI Laser</i>
477	10	45	<i>Edmund Optics</i>
480	10	45	<i>Edmund Optics / CVI Laser</i>
486	10	45	<i>Edmund Optics</i>
488	10	45	<i>CVI Laser</i>
490	10	45	<i>Edmund Optics</i>
492	10	45	<i>CVI Laser</i>
493	10	45	<i>OptoSigma</i>
500	10	50	<i>Edmund Optics</i>
500	40	50	<i>Edmund Optics / CVI Laser</i>
500	80	60	<i>CVI Laser</i>
500	10	45	<i>CVI Laser</i>
500	10	40	<i>CVI Laser</i>
500	25	50	<i>CVI Laser</i>
500	70	60	<i>CVI Laser</i>
505	10	45	<i>Edmund Optics</i>
508	10	45	<i>CVI Laser</i>
510	10	45	<i>Edmund Optics</i>

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(Edmund Optics, OptoSigma, CVI Laser Laser)**

Central Wavelength (nm)	FWHM (nm)	Peak Transmittance (%)	Supplier
515	10	45	<i>CVI Laser</i>
520	10	45	<i>CVI Laser</i>
520	10	40	<i>CVI Laser</i>
527	10	45	<i>Edmund Optics</i>
530	10	45	<i>CVI Laser</i>
532	10	45	<i>Edmund Optics</i>
535	10	45	<i>CVI Laser</i>
540	10	45	<i>Edmund Optics / OptoSigma</i>
546	10	45	<i>OptoSigma</i>
550	10	50	<i>Edmund Optics / CVI Laser</i>
550	40	50	<i>CVI Laser</i>
550	80	60	<i>CVI Laser</i>
550	10	45	<i>CVI Laser</i>
550	25	50	<i>CVI Laser</i>
550	70	60	<i>Edmund Optics</i>
560	10	50	<i>CVI Laser</i>
568	10	45	<i>CVI Laser</i>
570	10	50	<i>Edmund Optics</i>
577	10	50	<i>CVI Laser</i>
580	10	45	<i>CVI Laser</i>
580	10	50	<i>Edmund Optics</i>
585	10	50	<i>CVI Laser</i>
589	10	45	<i>OptoSigma</i>
590	10	50	<i>OptoSigma</i>
600	10	50	<i>Edmund Optics / CVI Laser</i>
600	40	50	<i>Edmund Optics / CVI Laser</i>
600	80	60	<i>CVI Laser</i>
600	10	45	<i>CVI Laser</i>
600	25	50	<i>CVI Laser</i>
600	70	60	<i>CVI Laser</i>
610	10	45	<i>Edmund Optics</i>
610	10	50	<i>CVI Laser</i>
620	10	45	<i>Edmund Optics / CVI Laser</i>
620	10	50	<i>CVI Laser</i>
630	10	50	<i>Edmund Optics</i>
632	10	45	<i>CVI Laser</i>
636	10	45	<i>Edmund Optics</i>
640	10	50	<i>Edmund Optics</i>
640	10	45	<i>Edmund Optics / OptoSigma</i>
647	10	45	<i>OptoSigma</i>
650	10	50	<i>Edmund Optics / CVI Laser</i>
650	40	50	<i>Edmund Optics / CVI Laser</i>
650	80	60	<i>CVI Laser</i>
650	10	45	<i>CVI Laser</i>
650	25	50	<i>CVI Laser</i>

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Central Wavelength (nm)	FWHM (nm)	Peak Transmittance (%)	Supplier
650	70	60	CVI Laser
656	10	50	CVI Laser
660	10	50	CVI Laser
670	10	50	CVI Laser
670	25	50	CVI Laser
670	40	50	Edmund Optics
670	70	60	CVI Laser
671	10	50	Edmund Optics / CVI Laser
675	20	50	CVI Laser
676	10	50	CVI Laser
680	10	50	Edmund Optics
685	10	50	CVI Laser
690	10	50	Edmund Optics / OptoSigma
694	10	50	OptoSigma
700	10	50	Edmund Optics / CVI Laser
700	40	50	Edmund Optics / CVI Laser
700	80	60	Edmund Optics / CVI Laser
700	25	50	CVI Laser
700	70	60	CVI Laser
400	10	40	OptoSigma
400	40	40	OptoSigma

Internet Sources:

Edmund Optics:

<http://www.edmundoptics.com/onlinecatalog/displayproduct.cfm?productID=1936>

<http://www.edmundoptics.com/onlinecatalog/displayproduct.cfm?productID=1903>

OptoSigma:

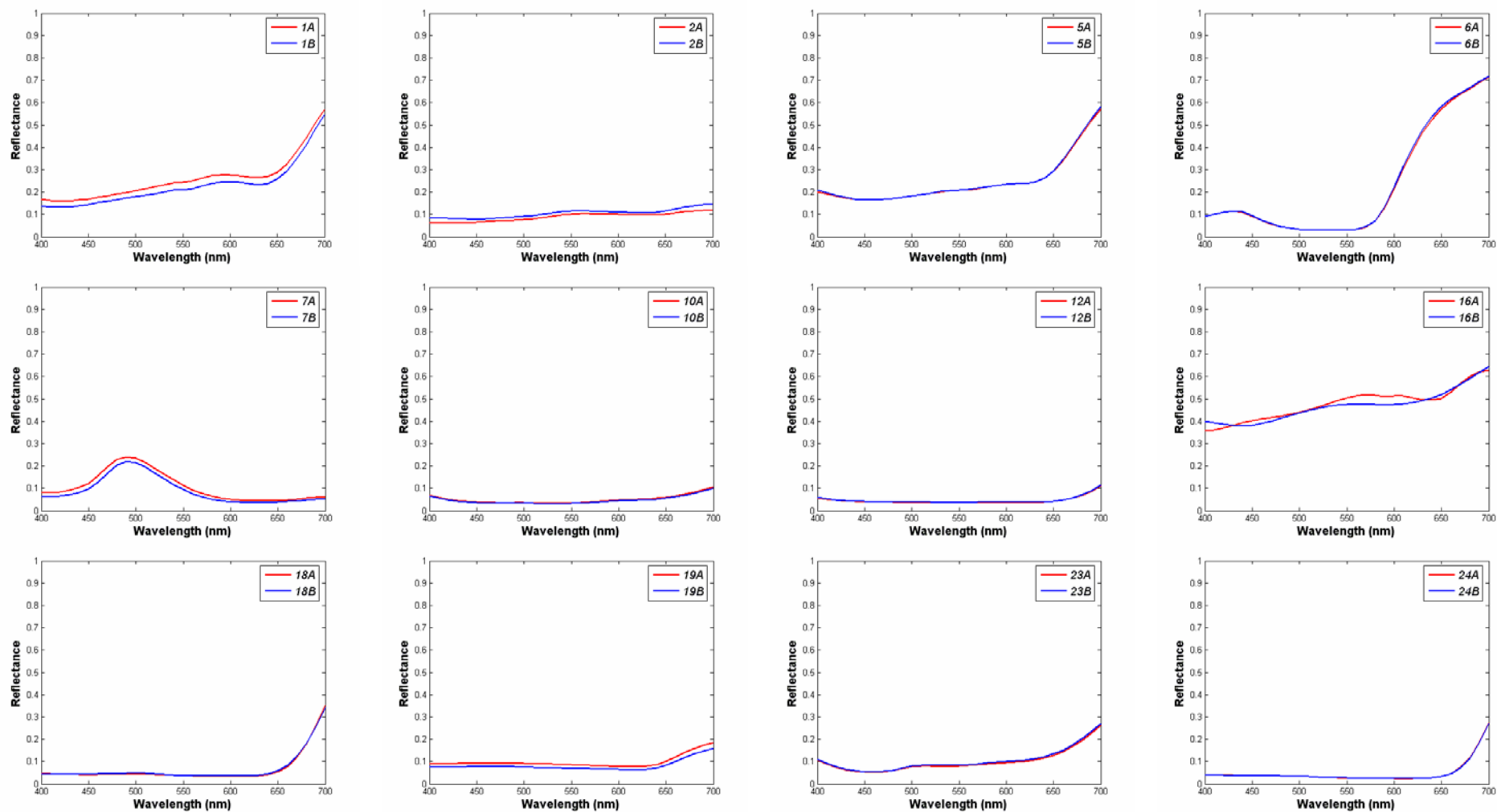
http://www.optosigma.com/miva/merchant.mv?Screen=PROD&Store_Code=OS&Product_Code=pg195-197

CVI Laser:

<http://www.cvilaser.com/Catalog/Pages/Template2.aspx?pcid=206&filter=0>

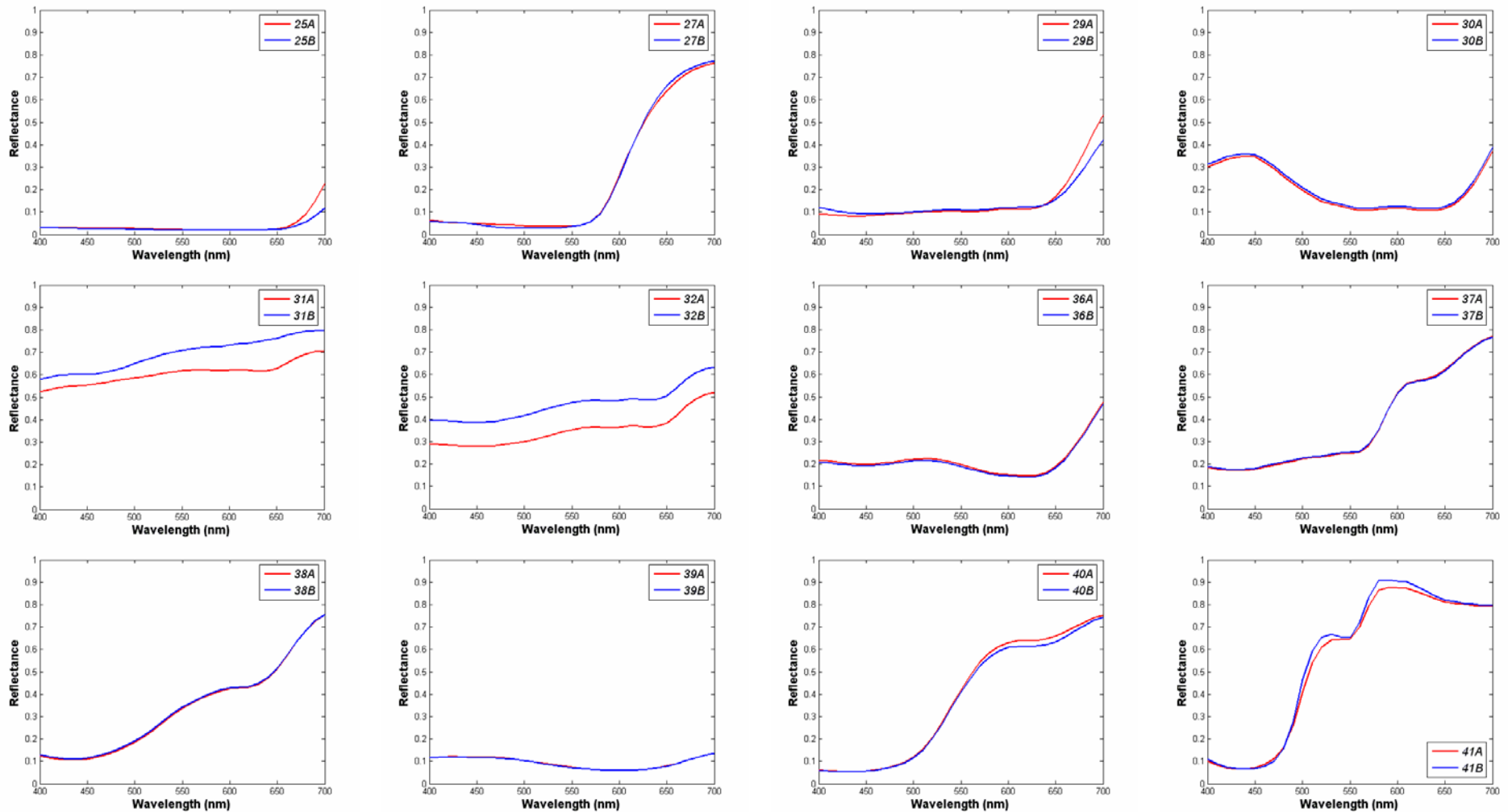
Appendix 9 Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER

Figure A9 (1) Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER.



Appendix 9 Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER

Figure A9 (2) Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER.



Appendix 9 Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER

Figure A9 (3) Reflectance spectra of the 28 pairs of textile samples provided by the INTEXTER.

