1 A. Photometric Bands and Conversions

Due to the differing normalizations between the SDSS and UKIDSS photometric systems, certain corrections are required. To present our data in the purest sense, all the NIR magnitudes from UKIDSS (originally AB magnitudes) were corrected to Vega magnitudes as suggested in Hewett et al. (2006).

Although ULAS magnitudes are reported in terms of Vega and SDSS magnitudes are reported in AB terms for the most part whenever an optical-NIR color was calculated both magnitudes were left in their default term.

References

González-Fernández C., et al., 2018, MNRAS, 474, 5459

Hewett P. C., Warren S. J., Leggett S. K., Hodgkin S. T., 2006, MNRAS, 367, 454

Peth M. A., Ross N. P., Schneider D. P., 2011, AJ, 141, 105

Table 1: Adapted from Table 9 of Peth et al. (2011). CTIO/DECam, PanSTARRS/PS1, LSST Filter only values. All wavelengths in Å. From González-Fernández et al. (2018) $Z_{\rm AB} - Z_{\rm Vega} = 0.502$; $Y_{\rm AB} - Y_{\rm Vega} = 0.600$; $J_{\rm AB} - J_{\rm Vega} = 0.916$; $H_{\rm AB} - H_{\rm Vega} = 1.366$; $Ks_{\rm AB} - Ks_{\rm Vega} = 1.827$; and the CASU Vega to AB conversions v1.3:: Z,Y,J,H,Ks were: 0.524, 0.618, 0.937, 1.384, 1.839. So, Δ(vs. Gonzalez-Fernandez):: (11.2, 1.1, 5.4, 1.6, 0.1) millimags. Δ(vsCASU v1.3):: (-10.8, -16.9, -15.6, -16.4, -11.9) millimags.

Band	$\lambda_{\rm eff}$	$\lambda_{\rm min}$	$\lambda_{\rm max}$	$W_{\rm eff}$	AB - Vega	Transformations
$g_{\rm HSC}$	4633	3940	5546	1460	$g_{\rm HSC}$	$= g_{\rm AB} + 0.097$
$g_{\rm LSST}$	4730	3877	5665	1333	$g_{\rm LSST}$	$= g_{\rm AB} + 0.083$
$g_{\rm DECam}$	4734	3939	5528	1133	$g_{\rm DECam}$	$= g_{\rm AB} + 0.083$
$g_{\rm PS1}$	4776	3943	5593	1167	$g_{\rm PS1}$	$= g_{\rm AB} + 0.080$
$r_{\rm HSC}$	6104	5325	7071	1503	$r_{\rm HSC}$	$= r_{\rm AB} - 0.151$
$r_{\rm PS1}$	6130	5386	7036	1318	$r_{\rm PS1}$	$= r_{\rm AB} - 0.153$
$r_{\rm LSST}$	6139	5375	7055	1338	$r_{\rm LSST}$	$= r_{\rm AB} - 0.155$
$r_{\rm DECam}$	6345	5506	7238	1379	$r_{\rm DECam}$	$= r_{\rm AB} - 0.192$
$i_{\rm PS1}$	7485	6778	8304	1243	$i_{\rm PS1}$	$= i_{\rm AB} - 0.369$
$i_{\rm LSST}$	7487	6765	8325	1209	$i_{\rm LSST}$	$= i_{\rm AB} - 0.369$
$i_{\rm HSC}$	7633	6791	8658	1483	$i_{\rm PS1}$	$= i_{\rm AB} - 0.396$
$i_{\rm DECam}$	7750	6950	8646	1371	$i_{\rm DECam}$	$= i_{\rm AB} - 0.415$
$z_{\rm PS1}$	8658	8028	9346	966	$z_{\rm PS1}$	$= z_{\rm AB} - 0.508$
$z_{\rm LSST}$	8669	8035	9375	994	$z_{\rm LSST}$	$= z_{\rm AB} - 0.509$
$Z_{\rm VIRCAM}$	8762	8157	9400	978	$Z_{\rm VIRCAM}$	$= Z_{\rm AB} - 0.513$
$Z_{\rm WFCAM}$	8802	8129	9457	926	$Z_{\rm WFCAM}$	$= Z_{\rm AB} - 0.514$
$z_{\rm HSC}$	8915	8280	9498	793	$Z_{\rm HSC}$	$= Z_{\rm AB} - 0.512$
$z_{\rm DECam}$	9216	8360	10166	1502	$z_{\rm DECam}$	$= z_{\rm AB} - 0.521$
$y_{\rm PS1}$	9603	9100	10838	615	$y_{\rm PS1}$	$= y_{\rm AB} - 0.541$
$y_{\rm LSST}$	9677	9089	10859	810	$y_{\rm LSST}$	$= y_{\rm AB} - 0.546$
$Y_{\rm DECam}$	9876	9355	10730	676	$Y_{\rm DECam}$	$= Y_{\rm AB} - 0.570$
$Y_{\rm HSC}$	9976	9000	10931	1386	$Y_{\rm HSC}$	$= Y_{\rm AB} - 0.580$
$Y_{\rm WFCAM}$	10305	9790	10810	1020	$Y_{\rm WFCAM}$	$= Y_{AB} - 0.617$
$Y_{\rm VIRCAM}$	10184	9427	10977	905	$Y_{\rm VIRCAM}$	$= Y_{AB} - 0.601$
$J_{\rm 2MASS}$	12350	10806	14068	1624	$J_{\rm 2MASS}$	$= J_{AB} - 0.894$
$J_{\rm VIRCAM}$	12464	11427	13759	1628	$J_{\rm VIRCAM}$	$= J_{AB} - 0.921$
$J_{\rm WFCAM}$	12483	11690	13280	1590	$J_{\rm WFCAM}$	$= J_{AB} - 0.919$
$W_{\rm Wircam}$	14514	13890	15166	1020	$W_{\rm Wircam}$	$= W_{AB} - 1.163$
$H_{\rm WFCAM}$	16313	14920	17840	2920	$H_{\rm WFCAM}$	$= H_{AB} - 1.379$
$H_{\rm VIRCAM}$	16310	14604	18422	2833	$H_{\rm VIRCAM}$	$= H_{AB} - 1.368$
$H_{\rm 2MASS}$	16620	14787	18231	2509	$H_{\rm 2MASS}$	$= H_{AB} - 1.374$
$Ks_{\rm VIRCAM}$	21337	19333	23674	3055	$Ks_{\rm VIRCAM}$	$= Ks_{AB} - 1.83$
$Ks_{\rm 2MASS}$	21590	19544	23552	2619	$Ks_{\rm 2MASS}$	$= Ks_{AB} - 1.84$
$K_{\rm WFCAM}$	22010	20290	23800	3510	$K_{\rm WFCAM}$	$= K_{AB} - 1.90$
WISE W1	33526	27541	38724	6626	W1	$= {\rm W1_{AB}} - 2.699$
WISE W2	46028	39633	53414	10423	W2	$= {\rm W2_{AB}} - 3.339$
WISE W3	115608	74430	172613	55056	W3	$= {\rm W3_{AB}} - 5.174$
WISE W4	228172	195201	279107	41017	W4	$= {\rm W4_{AB}} - 6.66$