RI - Cousins - 1976

Photometry in the red and near-infrared.

GENERAL INFORMATION

AUTHORS	A. W. J. Cousins
TELESCOPE	0.45m (reflector), South African Astronomical Obs.
DETECTOR	RCA C31034A (refrigerated), at Cape Obs.
	EMI 9659A (S-20 cathode), at Sutherland station
MAIN ARTICLE	Cousins A.W.J. 1976, Mem. R. Astr. Soc. 81, 25

SYSTEM DESCRIPTION

BANDS DESCRIPTION [178], pg. 83							FLUX CALIBRATION	
band	$filter_{Cape}$	$filter_{Sutherland}$	λ_0 (Å)	λ_{eff} (μm)	*WHM* (Å)	λ_c (Å)	F_ν (#)	F_λ (##)
R	interference	2mm OG570 + 2mm KG3	6700	0.64	1515	6470	3.08	2.254
I	3mm RGN9	Wratten 88A	8100	0.79	1090	7865	2.55	1.196
Added band								
V	2mm Omag 302	3mm GG495 + 1mm BG38		0.55			3.64	3.607

(#) For a 0.0 mag star, in units of 10^{-23} W m^{-2} Hz^{-1} [31]

(##) For a V = 0.0 A0V star, in units of 10^{-9} erg cm^{-2} s^{-1} $Å^{-1}$ [178], pg. 82

The *V* band is a realization with the EMI 9659 photomultiplier of the equivalent band in the *UBV - Johnson and Morgan - 1953*, originally obtained with a 1P21 tube.
An *UBVRI* system composed by the *UBV* bands from *UBV - Johnson and Morgan - 1953* and the Cousins' *RI* is sometimes called Johnson–Cousins in literature.

ZERO POINT: All color indices for unreddened A0 V stars are 0.00. [178], pg. 83

PHOTOGRAPHIC VERSION: Bessell, M. S. 1979, PASP 91, 589

SYSTEM ANALYSIS

REDDENING RATIOS [258]

$A_R = 2.66E(B-V)$ $\qquad$ $A_I = 2.10E(B-V)$

RELATIONS WITH OTHER SYSTEMS [31]

UVBGRI - Stebbins and Whitford - 1943

$$(V-I)_C = 1.5\,(G-R)_{St-W} + 0.75$$

RI - Kron and Smith - 1951

$(R-I)_C$	$= 0.118 + 1.03\,(R-I)_{KS}$		$(R-I)_{KS} < 0.35$
$(R-I)_C$	$= 0.033 + 1.246\,(R-I)_{KS}$	$0.35 <$	$(R-I)_{KS} < 1.30$
$(V-I)_C$	$= 0.27 + 0.936\,(V-I)_{KS}$		$(V-I)_{KS} > 0.5$
$(V-I)_C$	$= 0.24 + 1.00\,(V-I)_{KS}$		$(V-I)_{Ks} < 0.5$

*uvbyH*β - Strömgren and Crawford - 1956

$(V-I)_C$	=	$2.60\,(b-y) + 0.02$	$(b-y) < -0.05$
$(V-I)_C$	=	$2.12\,(b-y)$	$-0.05 < (b-y) < 0.12$
$(V-I)_C$	=	$1.53\,(b-y) + 0.075$	$0.12 < (b-y) < 0.60$

USNO - Kron and Mayall - 1960

$(V-I)_C$	=	$0.188 + 0.946\,(V-I)_{KM}$	$-0.4 < (V-I)_{KM} < 2.5$
$(V-I)_C$	=	$0.91\,(V-I)_{KM} + 0.26$	$2.2 < (V-I)_{KM} < 4.3$

UBVRI(JHKLMN) - Johnson - 1965

$(V-I)_C$	=	$0.713\,(V-I)_J$	$(V-I) < 0$
$(V-I)_C$	=	$0.778\,(V-I)_J$	$0 < (V-I)_J < 2.0$
$(V-I)_C$	=	$0.835\,(V-I)_J - 0.13$	$2.0 < (V-I)_J < 3.0$
$(R-I)_C$	=	$0.856\,(R-I)_J + 0.025 + \Delta(R-I)_J$	
$(V-R)_C$	=	$0.73\,(V-R)_J - 0.03$	$(V-R)_J < 1.0$
$(V-R)_C$	=	$0.62\,(V-R)_J - 0.08$	$1.0 < (V-R)_J < 1.7$
R_J	=	$0.988\,R_C - 0.002\ (\pm 0.02)$	[316]
I_J	=	$0.990\,I_C - 0.007\ (\pm 0.02)$	[316]

ri - Argue - 1967

$(V-R)_C$	=	$0.838\ (\pm 0.007)\ (V_{Johnson}-r) + 0.162\ (\pm 0.003)$	$-0.25 < (V_{Johnson}-r) < 0.79$ [296]

ri - Weistrop - 1975

$(R-I)_C$	=	$1.053\ (\pm 0.008)\ (r-i) - 0.077\ (\pm 0.010)$	$0.77 < (r-i) < 2.15$, class V only [296]

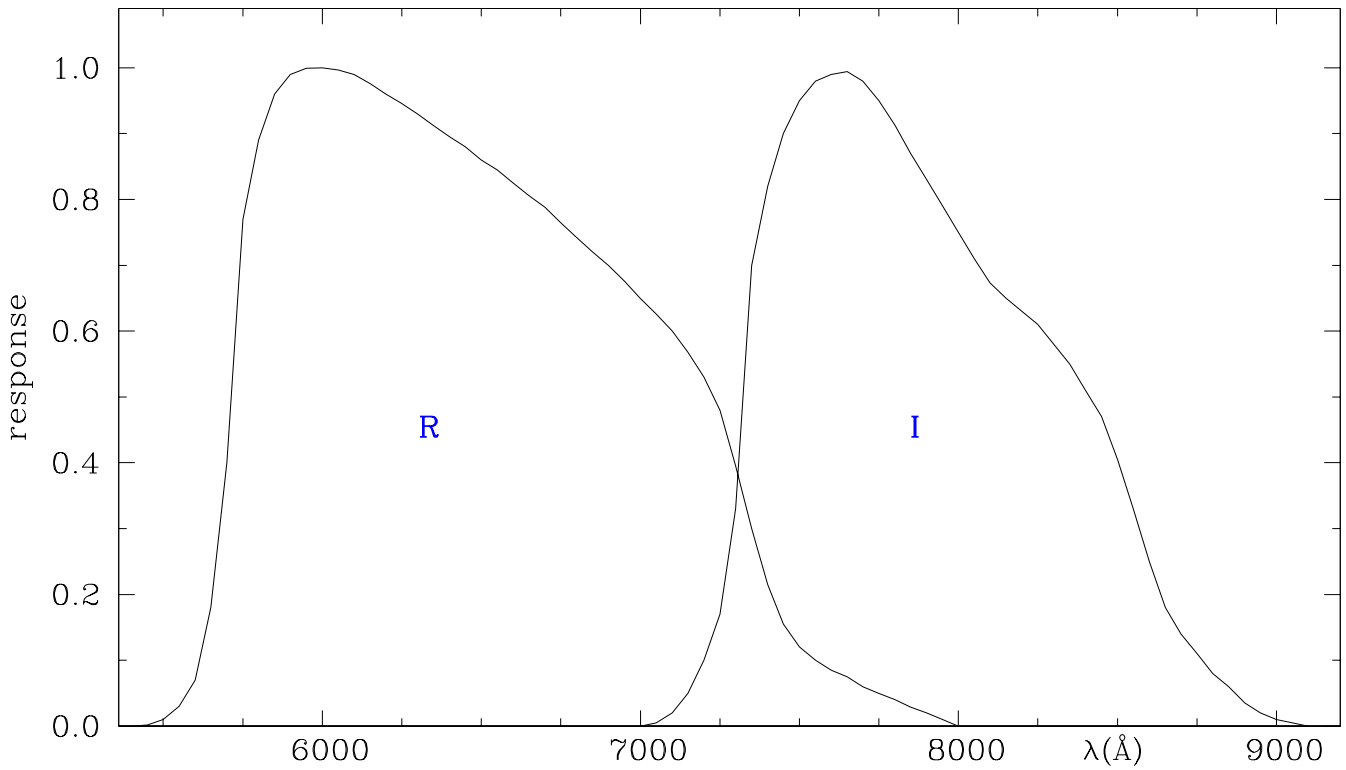
Washington - Canterna - 1976

$(R-I)_C$	=	$0.980\,(T_1-T_2)$	$-0.15 < (T_1-T_2) < 0.40$
$(R-I)_C$	=	$0.875\,(T_1-T_2) + 0.044$	$0.40 < (T_1-T_2) < 0.85$
$(V-R)_C$	=	$0.98\,(V-T_1) + 0.015$	$0 < (V-T_1) < 0.30$

BVRI - Kunkel and Rydgren - 1979

$(R-I)_C$	=	$1.12\,(r-i)$	$(r-i) < 1.0$
$(R-I)_C$	=	$1.233\,(r-i) - 0.133$	$(r-i) > 1.0$
$(V-I)_C$	=	$1.02\,(V-i) + 0.03$	$(V-i) < 1.6$
$(V-I)_C$	=	$0.96\,(V-i) + 0.13$	$(V-i) > 1.6$

TRANSMISSION CURVES [211]



R						*I*			
λ (Å)	ϒ	λ (Å)	ϒ	λ (Å)	ϒ	λ (Å)	ϒ	λ (Å)	ϒ
5400	0.000	6500	0.860	7600	0.085	7000	0.000	8100	0.673
5450	0.002	6550	0.845	7650	0.075	7050	0.005	8150	0.650
5500	0.010	6600	0.825	7700	0.060	7100	0.020	8200	0.630
5550	0.030	6650	0.806	7750	0.050	7150	0.050	8250	0.610
5600	0.070	6700	0.788	7800	0.040	7200	0.100	8300	0.580
5650	0.180	6750	0.765	7850	0.029	7250	0.170	8350	0.550
5700	0.400	6800	0.742	7900	0.020	7300	0.330	8400	0.510
5750	0.770	6850	0.720	7950	0.010	7350	0.700	8450	0.470
5800	0.890	6900	0.700	8000	0.000	7400	0.820	8500	0.405
5850	0.960	6950	0.676			7450	0.900	8550	0.330
5900	0.990	7000	0.650			7500	0.950	8600	0.250
5950	0.999	7050	0.626			7550	0.980	8650	0.180
6000	1.000	7100	0.600			7600	0.990	8700	0.140
6050	0.997	7150	0.568			7650	0.994	8750	0.110
6100	0.990	7200	0.530			7700	0.980	8800	0.080
6150	0.976	7250	0.480			7750	0.950	8850	0.060
6200	0.960	7300	0.395			7800	0.913	8900	0.035
6250	0.946	7350	0.300			7850	0.870	8950	0.020
6300	0.930	7400	0.215			7900	0.830	9000	0.010
6350	0.912	7450	0.155			7950	0.790	9050	0.005
6400	0.895	7500	0.120			8000	0.750	9100	0.000
6450	0.880	7550	0.100			8050	0.710		