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Investigation of empirical and theoretical light curves of First Overtone Cepheids in the Magellanic Clouds at multiwavelength

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1 COMPARISON OF THE PC/AC/PL RELATIONS BETWEEN THE OBSERVATION AND MODELS

Table 1. Coefficients of the PC relation for LMC FO Cepheids with $P < 2.5$ d at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 0.58$ d

PC	Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	Mean	0.064 ± 0.008	0.533 ± 0.002	0.134 ± 0.107	0.551 ± 0.049	0.034 ± 0.012	0.540 ± 0.003	4.732	**0.008**	1017
	Max	0.076 ± 0.010	0.449 ± 0.002	0.133 ± 0.100	0.457 ± 0.045	0.046 ± 0.014	0.456 ± 0.004	4.176	0.015	-
	Min	0.089 ± 0.008	0.595 ± 0.002	0.114 ± 0.093	0.588 ± 0.042	0.057 ± 0.011	0.603 ± 0.002	7.021	**0.000**	-
$V-Y$	Max	0.115 ± 0.021	0.538 ± 0.005	0.194 ± 0.231	0.572 ± 0.104	0.110 ± 0.029	0.539 ± 0.007	0.108	0.896	967
	Min	0.168 ± 0.018	0.883 ± 0.004	0.306 ± 0.163	0.913 ± 0.073	0.114 ± 0.025	0.894 ± 0.006	4.484	**0.011**	-
	Mean	0.119 ± 0.014	0.725 ± 0.003	0.283 ± 0.165	0.766 ± 0.075	0.062 ± 0.020	0.739 ± 0.004	7.886	**0.000**	-
$V-J$	Max	0.191 ± 0.023	0.709 ± 0.006	0.341 ± 0.247	0.772 ± 0.111	0.182 ± 0.032	0.710 ± 0.007	0.340	0.711	967
	Min	0.212 ± 0.019	1.039 ± 0.005	0.273 ± 0.196	1.036 ± 0.088	0.161 ± 0.026	1.051 ± 0.006	3.562	**0.028**	-
	Mean	0.114 ± 0.014	0.693 ± 0.004	0.248 ± 0.169	0.718 ± 0.076	0.056 ± 0.021	0.707 ± 0.004	7.427	**0.000**	-
$V-Ks$	Max	0.255 ± 0.024	1.010 ± 0.006	0.337 ± 0.229	0.991 ± 0.103	0.172 ± 0.033	1.030 ± 0.008	6.161	**0.002**	967
	Min	0.281 ± 0.018	1.301 ± 0.005	0.237 ± 0.167	1.235 ± 0.075	0.213 ± 0.026	1.318 ± 0.006	7.355	**0.000**	-
	Mean	0.249 ± 0.021	1.176 ± 0.005	0.271 ± 0.196	1.118 ± 0.088	0.147 ± 0.029	1.201 ± 0.007	12.361	**0.000**	-

Table 2. Coefficients of the AC relation for LMC FO Cepheids with $P < 2.5$ d at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 0.58$ d

AC	Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	Max	−0.422 ± 0.019	0.609 ± 0.006	−0.474 ± 0.068	0.548 ± 0.020	−0.453 ± 0.019	0.624 ± 0.007	56.150	**0.000**	1017
	Min	−0.009 ± 0.019	0.614 ± 0.007	−0.043 ± 0.080	0.556 ± 0.025	0.035 ± 0.019	0.627 ± 0.007	42.416	**0.000**	-
	Mean	−0.177 ± 0.019	0.606 ± 0.007	−0.261 ± 0.092	0.575 ± 0.026	−0.206 ± 0.019	0.620 ± 0.007	33.201	**0.000**	-
$V-Y$	Max	−0.668 ± 0.034	0.802 ± 0.012	−0.808 ± 0.154	0.746 ± 0.048	−0.762 ± 0.042	0.811 ± 0.012	18.459	**0.000**	967
	Min	0.337 ± 0.035	0.805 ± 0.012	0.087 ± 0.169	0.767 ± 0.052	0.321 ± 0.042	0.815 ± 0.013	27.772	**0.000**	-
	Mean	−0.130 ± 0.028	0.804 ± 0.010	−0.398 ± 0.143	0.779 ± 0.046	−0.228 ± 0.032	0.811 ± 0.010	35.208	**0.000**	-
$V-J$	Max	−0.712 ± 0.039	1.006 ± 0.014	−1.123 ± 0.170	0.986 ± 0.054	−0.824 ± 0.047	1.015 ± 0.014	29.877	**0.000**	967
	Min	0.295 ± 0.038	0.988 ± 0.013	−0.048 ± 0.188	0.947 ± 0.062	0.155 ± 0.045	0.999 ± 0.014	37.498	**0.000**	-
	Mean	−0.138 ± 0.029	0.773 ± 0.010	−0.390 ± 0.148	0.737 ± 0.048	−0.224 ± 0.034	0.780 ± 0.010	32.437	**0.000**	-
$V-Ks$	Max	−0.843 ± 0.049	1.353 ± 0.017	−1.103 ± 0.242	1.240 ± 0.076	−0.893 ± 0.048	1.381 ± 0.017	50.102	**0.000**	967
	Min	−0.011 ± 0.047	1.359 ± 0.017	−0.329 ± 0.218	1.290 ± 0.070	−0.037 ± 0.046	1.377 ± 0.016	44.340	**0.000**	-
	Mean	−0.421 ± 0.047	1.369 ± 0.017	−0.789 ± 0.219	1.293 ± 0.070	−0.452 ± 0.045	1.390 ± 0.016	55.364	**0.000**	-

Table 3. Coefficients of the PL relation for LMC FO Cepheids with $P < 2.5$ d at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 0.58$ d

PL	Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
V	Max	−3.279 ± 0.030	16.541 ± 0.008	−3.388 ± 0.303	16.440 ± 0.138	−3.362 ± 0.042	16.561 ± 0.010	3.917	**0.020**	1017
	Min	−3.228 ± 0.025	16.884 ± 0.007	−3.398 ± 0.255	16.747 ± 0.116	−3.328 ± 0.036	16.908 ± 0.009	7.963	**0.000**	-
	Mean	−3.269 ± 0.026	16.726 ± 0.007	−3.545 ± 0.277	16.540 ± 0.128	−3.391 ± 0.039	16.756 ± 0.010	9.417	**0.000**	-
I	Max	−3.349 ± 0.021	16.091 ± 0.005	−3.483 ± 0.218	15.994 ± 0.099	−3.408 ± 0.029	16.106 ± 0.007	4.301	**0.013**	1017
	Min	−3.313 ± 0.018	16.286 ± 0.005	−3.455 ± 0.191	16.178 ± 0.087	−3.387 ± 0.026	16.304 ± 0.006	8.215	**0.000**	-
	Mean	−3.354 ± 0.019	16.199 ± 0.005	−3.519 ± 0.204	16.092 ± 0.094	−3.417 ± 0.028	16.214 ± 0.007	4.918	**0.007**	-
Y	Max	−3.377 ± 0.023	16.032 ± 0.006	−3.276 ± 0.264	16.031 ± 0.120	−3.453 ± 0.032	16.051 ± 0.006	5.313	**0.005**	967
	Min	−3.380 ± 0.023	16.032 ± 0.013	−3.502 ± 0.235	15.946 ± 0.106	−3.429 ± 0.045	16.044 ± 0.008	2.515	0.081	-
	Mean	−3.367 ± 0.021	16.029 ± 0.005	−3.539 ± 0.148	15.903 ± 0.102	−3.441 ± 0.029	16.047 ± 0.007	7.123	**0.000**	-
J	Max	−3.448 ± 0.020	15.822 ± 0.005	−3.487 ± 0.207	15.744 ± 0.093	−3.549 ± 0.027	15.847 ± 0.007	12.857	**0.000**	967
	Min	−3.421 ± 0.020	15.836 ± 0.005	−3.688 ± 0.210	15.685 ± 0.094	−3.470 ± 0.028	15.848 ± 0.007	4.535	**0.010**	-
	Mean	−3.367 ± 0.021	16.029 ± 0.005	−3.539 ± 0.225	15.903 ± 0.102	−3.441 ± 0.029	16.047 ± 0.007	7.123	**0.000**	-
Ks	Max	−3.516 ± 0.014	15.473 ± 0.003	−3.685 ± 0.149	15.372 ± 0.066	−3.554 ± 0.020	15.483 ± 0.007	5.047	**0.006**	967
	Min	−3.485 ± 0.015	15.523 ± 0.005	−3.693 ± 0.129	15.386 ± 0.057	−3.549 ± 0.020	15.539 ± 0.005	12.621	**0.000**	-
	Mean	−3.500 ± 0.014	15.495 ± 0.004	−3.639 ± 0.123	15.394 ± 0.054	−3.557 ± 0.020	15.509 ± 0.005	9.516	**0.000**	-

Table 4. Coefficients of the PL relation for LMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 2.5$ d.

PL		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
V	B	Max	-3.457 ± 0.040	-2.028 ± 0.022	-3.703 ± 0.150	-2.007 ± 0.029	-3.148 ± 0.125	-2.217 ± 0.077	4.709	**0.000**	87
		Min	-3.354 ± 0.046	-1.582 ± 0.025	-3.473 ± 0.165	-1.551 ± 0.031	-2.676 ± 0.134	-2.003 ± 0.082	11.235	**0.000**	-
		Mean	-3.379 ± 0.047	-1.774 ± 0.025	-3.638 ± 0.149	-1.731 ± 0.028	-2.527 ± 0.124	-2.301 ± 0.076	22.226	**0.000**	-
	D	Max	-2.934 ± 0.045	-2.148 ± 0.026	-3.104 ± 0.109	-2.146 ± 0.031	-2.964 ± 0.113	-2.124 ± 0.070	2.172	0.118	129
		Min	-2.908 ± 0.046	-1.679 ± 0.026	-2.870 ± 0.149	-1.685 ± 0.042	-2.957 ± 0.101	-1.649 ± 0.063	0.154	0.856	-
		Mean	-2.972 ± 0.052	-1.857 ± 0.029	-3.351 ± 0.134	-1.796 ± 0.038	-2.823 ± 0.107	-1.944 ± 0.066	6.384	**0.002**	-
I	B	Max	-3.492 ± 0.034	-2.467 ± 0.019	-3.788 ± 0.099	-2.437 ± 0.019	-3.025 ± 0.098	-2.753 ± 0.061	16.067	**0.000**	87
		Min	-3.503 ± 0.041	-2.180 ± 0.022	-3.659 ± 0.0156	-2.149 ± 0.029	-2.858 ± 0.110	-2.580 ± 0.067	13.807	**0.000**	-
		Mean	-3.487 ± 0.042	-2.307 ± 0.023	-3.758 ± 0.143	-2.266 ± 0.027	-2.726 ± 0.107	-2.777 ± 0.006	22.681	**0.000**	-
	D	Max	-3.123 ± 0.037	-2.579 ± 0.021	-3.226 ± 0.110	-2.577 ± 0.031	-3.127 ± 0.086	-2.574 ± 0.054	1.077	0.343	129
		Min	-3.137 ± 0.040	-2.285 ± 0.023	-3.095 ± 0.140	-2.290 ± 0.040	-3.179 ± 0.082	-2.259 ± 0.051	0.196	0.821	-
		Mean	-3.212 ± 0.043	-2.371 ± 0.024	-3.522 ± 0.127	-2.323 ± 0.036	-3.106 ± 0.085	-2.432 ± 0.053	6.027	**0.003**	-
G	B	Max	-3.466 ± 0.036	-2.153 ± 0.020	-3.750 ± 0.113	-2.128 ± 0.022	-3.112 ± 0.112	-2.369 ± 0.069	8.584	**0.000**	87
		Min	-3.388 ± 0.045	-1.761 ± 0.024	-3.526 ± 0.161	-1.729 ± 0.030	-2.708 ± 0.126	-2.183 ± 0.078	12.449	**0.000**	-
		Mean	-3.414 ± 0.045	-1.928 ± 0.025	-3.692 ± 0.146	-1.884 ± 0.024	-2.583 ± 0.118	-2.441 ± 0.073	23.196	**0.000**	-
	D	Max	-3.013 ± 0.042	-2.261 ± 0.024	-3.160 ± 0.109	-2.258 ± 0.031	-3.031 ± 0.103	-2.245 ± 0.064	1.795	0.170	129
		Min	-2.972 ± 0.043	-1.858 ± 0.025	-2.941 ± 0.144	-1.862 ± 0.041	-3.013 ± 0.094	-1.833 ± 0.059	0.119	0.887	-
		Mean	-3.049 ± 0.049	-2.004 ± 0.028	-3.419 ± 0.129	-1.945 ± 0.037	-2.902 ± 0.100	-2.091 ± 0.062	6.809	**0.001**	-
G_{RP}	B	Max	-3.575 ± 0.036	-2.429 ± 0.020	-3.856 ± 0.118	-2.396 ± 0.023	-3.063 ± 0.100	-2.744 ± 0.062	15.361	**0.000**	87
		Min	-3.515 ± 0.040	-2.154 ± 0.022	-3.717 ± 0.120	-2.116 ± 0.023	-2.809 ± 0.113	-2.591 ± 0.070	19.903	**0.000**	-
		Mean	-3.521 ± 0.043	-2.282 ± 0.023	-3.828 ± 0.126	-2.235 ± 0.024	-2.699 ± 0.108	-2.789 ± 0.066	29.311	**0.000**	-
	D	Max	-3.127 ± 0.038	-2.581 ± 0.022	-3.237 ± 0.110	-2.578 ± 0.031	-3.132 ± 0.089	-2.574 ± 0.056	1.194	0.306	129
		Min	-3.107 ± 0.040	-2.279 ± 0.023	-3.067 ± 0.138	-2.284 ± 0.039	-3.151 ± 0.082	-2.251 ± 0.051	0.198	0.820	-
		Mean	-3.189 ± 0.044	-2.372 ± 0.025	-3.520 ± 0.125	-2.320 ± 0.035	-3.068 ± 0.088	-2.443 ± 0.054	6.687	**0.002**	-
J	B	Max	-3.642 ± 0.036	-2.705 ± 0.020	-3.936 ± 0.099	-2.666 ± 0.019	-3.005 ± 0.095	-3.098 ± 0.059	26.335	**0.000**	87
		Min	-3.605 ± 0.037	-2.564 ± 0.020	-3.823 ± 0.113	-2.527 ± 0.021	-2.939 ± 0.101	-2.975 ± 0.062	21.953	**0.000**	-
		Mean	-3.601 ± 0.040	-2.643 ± 0.021	-3.913 ± 0.114	-2.598 ± 0.022	-2.838 ± 0.100	-3.113 ± 0.062	30.265	**0.000**	-
	D	Max	-3.286 ± 0.035	-2.863 ± 0.020	-3.353 ± 0.114	-2.859 ± 0.032	-3.262 ± 0.075	-2.876 ± 0.047	0.505	0.604	129
		Min	-3.464 ± 0.035	-2.573 ± 0.020	-3.899 ± 0.059	-2.492 ± 0.017	-3.357 ± 0.068	-2.634 ± 0.042	15.897	**0.000**	-
		Mean	-3.359 ± 0.038	-2.719 ± 0.022	-3.648 ± 0.119	-2.675 ± 0.034	-3.268 ± 0.075	-2.771 ± 0.046	6.445	**0.002**	-
Ks	B	Max	-3.711 ± 0.039	-2.868 ± 0.021	-3.984 ± 0.116	-2.826 ± 0.022	-2.971 ± 0.101	-3.325 ± 0.062	27.526	**0.000**	87
		Min	-3.668 ± 0.036	-2.842 ± 0.019	-2.805 ± 0.021	-2.805 ± 0.021	-3.021 ± 0.095	-3.242 ± 0.058	23.737	**0.000**	-
		Mean	-3.655 ± 0.038	-2.883 ± 0.020	-3.973 ± 0.110	-2.839 ± 0.021	-2.936 ± 0.097	-3.326 ± 0.059	30.142	**0.000**	-
	D	Max	-3.398 ± 0.034	-3.043 ± 0.019	-3.439 ± 0.119	-3.037 ± 0.034	-3.353 ± 0.069	-3.070 ± 0.043	0.284	0.752	129
		Min	-3.580 ± 0.032	-2.855 ± 0.018	-3.972 ± 0.058	-2.782 ± 0.016	-3.489 ± 0.061	-2.906 ± 0.038	15.736	**0.000**	-
		Mean	-3.482 ± 0.035	-2.949 ± 0.020	-3.741 ± 0.116	-2.911 ± 0.033	-3.410 ± 0.067	-2.989 ± 0.041	6.086	**0.003**	-

Table 5. Coefficients of the PC relation for LMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at P = 2.5 d.

PC		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	B	Max	0.050 ± 0.016	0.428 ± 0.009	0.075 ± 0.050	0.420 ± 0.009	−0.122 ± 0.055	0.536 ± 0.034	5.151	**0.000**	87
		Min	0.148 ± 0.009	0.598 ± 0.005	0.186 ± 0.015	0.598 ± 0.002	0.181 ± 0.037	0.577 ± 0.023	1.631	0.000	-
		Mean	0.108 ± 0.009	0.532 ± 0.025	0.120 ± 0.018	0.535 ± 0.003	0.198 ± 0.033	0.476 ± 0.020	4.715	**0.000**	-
	D	Max	0.188 ± 0.013	0.430 ± 0.007	0.122 ± 0.023	0.430 ± 0.006	0.165 ± 0.034	0.447 ± 0.021	4.558	**0.012**	129
		Min	0.236 ± 0.008	0.603 ± 0.004	0.225 ± 0.011	0.604 ± 0.003	0.249 ± 0.023	0.595 ± 0.014	0.383	0.682	-
		Mean	0.240 ± 0.012	0.513 ± 0.007	0.170 ± 0.015	0.526 ± 0.004	0.283 ± 0.028	0.487 ± 0.017	4.265	**0.016**	-
$V-G$	B	Max	0.027 ± 0.006	0.111 ± 0.003	0.034 ± 0.017	0.108 ± 0.003	−0.036 ± 0.020	0.151 ± 0.012	5.349	**0.000**	87
		Min	0.029 ± 0.002	0.181 ± 0.001	0.046 ± 0.004	0.180 ± 0.001	0.026 ± 0.008	0.183 ± 0.005	3.075	**0.000**	-
		Mean	0.035 ± 0.003	0.153 ± 0.001	0.054 ± 0.009	0.153 ± 0.001	0.056 ± 0.010	0.140 ± 0.006	5.279	**0.000**	-
	D	Max	0.079 ± 0.004	0.112 ± 0.002	0.056 ± 0.008	0.112 ± 0.002	0.066 ± 0.012	0.121 ± 0.007	4.890	**0.009**	129
		Min	0.066 ± 0.002	0.177 ± 0.001	0.070 ± 0.005	0.177 ± 0.001	0.065 ± 0.008	0.178 ± 0.005	0.268	0.764	-
		Mean	0.076 ± 0.004	0.147 ± 0.002	0.064 ± 0.009	0.149 ± 0.001	0.080 ± 0.010	0.145 ± 0.006	0.822	0.441	-
$V-G_{RP}$	B	Max	0.072 ± 0.014	0.428 ± 0.008	0.098 ± 0.046	0.421 ± 0.008	−0.082 ± 0.048	0.524 ± 0.029	5.272	**0.000**	87
		Min	0.119 ± 0.008	0.596 ± 0.004	0.160 ± 0.017	0.595 ± 0.003	0.137 ± 0.031	0.585 ± 0.019	1.725	0.000 -	
		Mean	0.103 ± 0.008	0.531 ± 0.004	0.124 ± 0.017	0.533 ± 0.003	0.176 ± 0.028	0.485 ± 0.017	4.699	0.000 -	
	D	Max	0.193 ± 0.012	0.432 ± 0.006	0.136 ± 0.021	0.431 ± 0.006	0.168 ± 0.031	0.450 ± 0.019	4.313	**0.015**	129
		Min	0.205 ± 0.008	0.597 ± 0.005	0.199 ± 0.012	0.598 ± 0.003	0.221 ± 0.023	0.587 ± 0.014	0.316	0.729	-
		Mean	0.216 ± 0.010	0.515 ± 0.001	0.165 ± 0.014	0.524 ± 0.003	0.246 ± 0.025	0.497 ± 0.015	2.832	0.062 -	
$V-J$	B	Max	0.135 ± 0.026	0.706 ± 0.014	0.181 ± 0.083	0.693 ± 0.016	−0.140 ± 0.087	0.878 ± 0.053	5.204	**0.000**	87
		Min	0.199 ± 0.012	1.007 ± 0.007	0.266 ± 0.029	1.005 ± 0.005	0.234 ± 0.047	0.984 ± 0.029	2.290	**0.000**	-
		Mean	0.183 ± 0.014	0.892 ± 0.007	0.208 ± 0.030	0.896 ± 0.005	0.315 ± 0.050	0.809 ± 0.031	4.601	**0.000**	-
	D	Max	0.352 ± 0.021	0.714 ± 0.012	0.252 ± 0.039	0.712 ± 0.011	0.298 ± 0.055	0.751 ± 0.034	4.442	**0.013**	129
		Min	0.372 ± 0.016	1.004 ± 0.009	0.334 ± 0.021	1.009 ± 0.006	0.423 ± 0.045	0.972 ± 0.028	1.273	0.283	-
		Mean	0.385 ± 0.019	0.862 ± 0.011	0.292 ± 0.025	0.880 ± 0.007	0.446 ± 0.044	0.825 ± 0.027	3.172	**0.045**	-
$V-Ks$	B	Max	0.183 ± 0.034	0.833 ± 0.019	0.241 ± 0.110	0.886 ± 0.021	−0.174 ± 0.114	1.105 ± 0.070	5.078	**0.000**	87
		Min	0.258 ± 0.017	1.287 ± 0.009	0.350 ± 0.035	1.284 ± 0.007	0.304 ± 0.064	1.257 ± 0.039	2.214	**0.000**	-
		Mean	0.237 ± 0.018	1.132 ± 0.010	0.268 ± 0.041	1.137 ± 0.007	0.412 ± 0.067	1.023 ± 0.041	4.476	**0.000**	-
	D	Max	0.465 ± 0.028	0.893 ± 0.016	0.337 ± 0.052	0.890 ± 0.015	0.389 ± 0.073	0.946 ± 0.045	4.369	**0.014**	129
		Min	0.494 ± 0.022	1.282 ± 0.013	0.441 ± 0.029	1.290 ± 0.008	0.563 ± 0.063	1.240 ± 0.039	1.279	0.281	-
		Mean	0.508 ± 0.026	1.092 ± 0.015	0.386 ± 0.034	1.115 ± 0.009	0.588 ± 0.060	1.044 ± 0.037	3.025	**0.052**	-

Table 6. Coefficients of the AC relation for LMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 2.5$ d.

PC		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	B	Max	-0.202 ± 0.035	0.551 ± 0.017	-0.209 ± 0.039	0.518 ± 0.018	-0.322 ± 0.039	0.623 ± 0.020	32.080	**0.000**	87
		Min	0.233 ± 0.036	0.558 ± 0.018	0.101 ± 0.054	0.575 ± 0.023	0.190 ± 0.035	0.592 ± 0.018	35.518	**0.000**	-
		Mean	0.104 ± 0.033	0.535 ± 0.016	-0.034 ± 0.039	0.561 ± 0.017	0.121 ± 0.037	0.536 ± 0.019	30.478	**0.000**	-
	D	Max	-0.465 ± 0.064	0.760 ± 0.031	-0.540 ± 0.107	0.744 ± 0.058	-0.256 ± 0.061	0.673 ± 0.029	39.114	**0.000**	129
		Min	-0.138 ± 0.066	0.799 ± 0.032	-0.148 ± 0.126	0.739 ± 0.067	0.090 ± 0.056	0.704 ± 0.026	58.723	**0.000**	-
		Mean	-0.202 ± 0.076	0.742 ± 0.037	0.027 ± 0.108	0.548 ± 0.057	-0.054 ± 0.069	0.687 ± 0.033	51.631	**0.000**	-
$V-G$	B	Max	-0.064 ± 0.014	0.157 ± 0.007	-0.072 ± 0.015	0.143 ± 0.007	-0.115 ± 0.014	0.187 ± 0.007	46.857	**0.000**	87
		Min	0.050 ± 0.008	0.173 ± 0.003	0.023 ± 0.012	0.177 ± 0.005	0.046 ± 0.009	0.177 ± 0.004	14.586	**0.000**	-
		Mean	0.027 ± 0.011	0.157 ± 0.005	-0.013 ± 0.018	0.165 ± 0.008	0.030 ± 0.011	0.159 ± 0.005	24.985	**0.000**	-
	D	Max	-0.177 ± 0.025	0.241 ± 0.012	-0.209 ± 0.047	0.235 ± 0.025	-0.089 ± 0.022	0.205 ± 0.010	50.051	**0.000**	129
		Min	-0.031 ± 0.018	0.229 ± 0.009	-0.030 ± 0.029	0.212 ± 0.0160	0.027 ± 0.017	0.205 ± 0.008	44.781	**0.000**	-
		Mean	-0.084 ± 0.024	0.230 ± 0.012	0.017 ± 0.040	0.559 ± 0.017	-0.050 ± 0.022	0.218 ± 0.010	47.099	**0.000**	-
$V-G_RP$	B	Max	-0.157 ± 0.035	0.541 ± 0.017	-0.189 ± 0.040	0.513 ± 0.018	-0.271 ± 0.034	0.611 ± 0.017	48.087	**0.000**	87
		Min	0.201 ± 0.026	0.560 ± 0.013	0.124 ± 0.043	0.566 ± 0.018	0.154 ± 0.029	0.591 ± 0.015	21.094	**0.000**	-
		Mean	0.090 ± 0.030	0.537 ± 0.015	-0.031 ± 0.038	0.559 ± 0.017	0.098 ± 0.033	0.543 ± 0.016	32.657	**0.000**	-
	D	Max	-0.437 ± 0.062	0.750 ± 0.030	-0.513 ± 0.116	0.734 ± 0.062	-0.226 ± 0.056	0.662 ± 0.027	45.639	**0.000**	129
		Min	-0.114 ± 0.059	0.765 ± 0.029	-0.115 ± 0.101	0.709 ± 0.054	0.077 ± 0.052	0.685 ± 0.025	49.376	**0.000**	-
		Mean	-0.183 ± 0.068	0.721 ± 0.033	0.036 ± 0.104	0.540 ± 0.055	-0.0545 ± 0.061	0.674 ± 0.029	52.458	**0.000**	-
$V-Y$	B	Max	-0.279 ± 0.064	0.910 ± 0.032	-0.340 ± 0.073	0.859 ± 0.033	-0.487 ± 0.062	1.038 ± 0.031	49.978	**0.000**	87
		Min	0.342 ± 0.052	0.944 ± 0.025	0.152 ± 0.079	0.971 ± 0.035	0.293 ± 0.053	0.984 ± 0.027	30.001	**0.000**	-
		Mean	0.160 ± 0.058	0.904 ± 0.027	-0.059 ± 0.066	0.943 ± 0.030	0.176 ± 0.058	0.913 ± 0.030	34.156	**0.000**	-
	D	Max	-0.789 ± 0.112	1.290 ± 0.055	-0.946 ± 0.214	1.270 ± 0.115	-0.401 ± 0.099	1.127 ± 0.048	48.000	**0.000**	129
		Mi	-0.209 ± 0.113	1.309 ± 0.055	-0.179 ± 0.163	1.189 ± 0.088	0.147 ± 0.104	1.162 ± 0.052	46.248	**0.000**	-
		Mean	-0.299 ± 0.122	1.216 ± 0.060	0.065 ± 0.184	0.907 ± 0.097	-0.059 ± 0.109	1.128 ± 0.052	52.425	**0.000**	-
$V-Ks$	B	Max	-0.362 ± 0.085	1.150 ± 0.042	-0.451 ± 0.097	1.086 ± 0.044	-0.632 ± 0.081	1.318 ± 0.041	51.405	**0.000**	87
		Min	0.452 ± 0.069	1.201 ± 0.034	0.200 ± 0.104	1.239 ± 0.046	0.393 ± 0.072	1.251 ± 0.036	27.916	**0.000**	-
		Mean	0.210 ± 0.070	1.146 ± 0.030	-0.080 ± 0.085	1.199 ± 0.039	0.235 ± 0.077	1.156 ± 0.039	33.214	**0.000**	-
	D	Max	-1.037 ± 0.148	1.651 ± 0.072	-1.258 ± 0.286	1.633 ± 0.154	-0.523 ± 0.130	1.435 ± 0.062	48.476	**0.000**	129
		Min	-0.275 ± 0.152	1.687 ± 0.074	-0.236 ± 0.216	1.527 ± 0.116	0.200 ± 0.141	1.490 ± 0.068	44.906	**0.000**	-
		Mean	-0.385 ± 0.163	1.554 ± 0.080	0.088 ± 0.243	1.150 ± 0.128	-0.063 ± 0.146	1.435 ± 0.070	51.481	**0.000**	-

Table 7. Coefficients of the PL relation for SMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 2.5$ d.

PL		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
V	B	Max	-2.956 ± 0.063	-2.340 ± 0.027	-2.723 ± 0.110	-2.341 ± 0.032	-2.504 ± 0.219	-2.630 ± 0.121	8.000	**0.000**	104
		Min	-3.613 ± 0.054	-1.527 ± 0.023	-3.413 ± 0.104	-1.550 ± 0.028	-2.861 ± 0.179	-1.964 ± 0.098	11.563	**0.000**	-
		Mean	-3.039 ± 0.080	-1.988 ± 0.035	-2.758 ± 0.097	-2.000 ± 0.028	-3.477 ± 0.497	-1.787 ± 0.263	5.251	**0.006**	-
	D	Max	-2.957 ± 0.058	-2.174 ± 0.025	-2.751 ± 0.107	-2.179 ± 0.027	-3.164 ± 0.305	-2.078 ± 0.168	3.156	**0.046**	121
		Min	-2.845 ± 0.057	-1.708 ± 0.025	-2.491 ± 0.102	-1.717 ± 0.026	-3.335 ± 0.269	-1.469 ± 0.148	11.463	**0.000**	-
		Mean	-2.876 ± 0.058	-1.929 ± 0.025	-2.595 ± 0.104	-1.936 ± 0.026	-3.206 ± 0.304	-1.772 ± 0.168	6.384	**0.002**	-
I	B	Max	-3.259 ± 0.056	-2.626 ± 0.024	-2.999 ± 0.098	-2.636 ± 0.028	-2.810 ± 0.177	-2.914 ± 0.098	12.034	**0.000**	104
		Min	-3.721 ± 0.052	-2.120 ± 0.022	-3.538 ± 0.103	-2.139 ± 0.028	-2.937 ± 0.155	-2.574 ± 0.086	12.988	**0.000**	-
		Mean	-3.200 ± 0.075	-2.467 ± 0.033	-2.901 ± 0.092	-2.480 ± 0.027	-3.651 ± 0.435	-2.262 ± 0.238	6.974	**0.001**	-
	D	Max	-3.102 ± 0.052	-2.598 ± 0.023	-2.860 ± 0.094	-2.605 ± 0.024	-3.473 ± 0.273	-2.415 ± 0.150	5.869	**0.003**	121
		Min	-3.062 ± 0.053	-2.306 ± 0.023	-2.716 ± 0.096	-2.317 ± 0.024	-3.615 ± 0.247	-2.032 ± 0.136	13.072	**0.000**	-
		Mean	-3.060 ± 0.053	-2.449 ± 0.024	-2.772 ± 0.095	-2.457 ± 0.024	-3.501 ± 0.272	-2.231 ± 0.150	6.027	**0.002**	-
G	B	Max	-3.111 ± 0.061	-2.384 ± 0.026	-2.883 ± 0.111	-2.392 ± 0.032	-2.630 ± 0.201	-2.686 ± 0.111	7.901	**0.000**	104
		Min	-3.626 ± 0.055	-1.708 ± 0.024	-3.458 ± 0.103	-1.724 ± 0.028	-2.784 ± 0.189	-2.194 ± 0.104	11.952	**0.000**	-
		Mean	-3.102 ± 0.078	-2.119 ± 0.034	-2.820 ± 0.095	-2.131 ± 0.028	-3.539 ± 0.466	-1.919 ± 0.255	5.611	**0.004**	-
	D	Max	-3.023 ± 0.055	-2.282 ± 0.024	-2.806 ± 0.102	-2.287 ± 0.025	-3.288 ± 0.292	-2.155 ± 0.161	3.966	**0.021**	121
		Min	-2.911 ± 0.055	-1.883 ± 0.024	-2.569 ± 0.099	-1.892 ± 0.025	-3.404 ± 0.262	-1.641 ± 0.144	11.365	**0.000**	-
		Mean	-2.945 ± 0.056	-2.074 ± 0.024	-2.672 ± 0.100	-2.081 ± 0.025	-3.298 ± 0.294	-1.904 ± 0.162	6.393	**0.002**	-
$V - G_{RP}$	B	Max	-3.247 ± 0.057	-2.623 ± 0.025	-2.988 ± 0.101	-2.648 ± 0.029	-2.809 ± 0.180	-2.920 ± 0.099	11.406	**0.000**	104
		Min	-3.699 ± 0.052	-2.114 ± 0.023	-3.529 ± 0.103	-2.131 ± 0.028	-2.892 ± 0.164	-2.581 ± 0.090	12.623	**0.000**	-
		Mean	-3.196 ± 0.075	-2.463 ± 0.033	-2.905 ± 0.092	-2.475 ± 0.027	-3.641 ± 0.441	-2.260 ± 0.242	6.534	**0.002**	-
	D	Max	-3.112 ± 0.052	-2.593 ± 0.023	-2.876 ± 0.095	-2.599 ± 0.024	-3.467 ± 0.275	-2.418 ± 0.151	5.489	**0.005**	121
		Min	-3.033 ± 0.053	-2.295 ± 0.023	-2.696 ± 0.095	-2.305 ± 0.024	-3.565 ± 0.250	-2.031 ± 0.138	12.272	**0.000**	-
		Mean	-3.057 ± 0.053	-2.440 ± 0.023	-2.773 ± 0.095	-2.448 ± 0.024	-3.489 ± 0.273	-2.226 ± 0.150	7.980	**0.000**	-
J	B	Max	-3.515 ± 0.057	-2.815 ± 0.025	-3.223 ± 0.111	-2.843 ± 0.030	-3.065 ± 0.162	-3.096 ± 0.090	11.320	**0.000**	104
		Min	-3.769 ± 0.050	-2.530 ± 0.022	-3.609 ± 0.102	-2.545 ± 0.028	-2.992 ± 0.141	-2.978 ± 0.078	12.577	**0.000**	-
		Mean	-3.316 ± 0.072	-2.795 ± 0.032	-3.017 ± 0.088	-2.808 ± 0.026	-3.771 ± 0.418	-2.588 ± 0.229	7.543	**0.000**	-
	D	Max	-3.242 ± 0.050	-2.877 ± 0.022	-2.982 ± 0.089	-2.885 ± 0.022	-3.707 ± 0.261	-2.644 ± 0.144	7.830	**0.000**	121
		Min	-3.167 ± 0.050	-2.710 ± 0.022	-2.832 ± 0.090	-2.720 ± 0.022	-3.793 ± 0.234	-2.393 ± 0.129	14.255	**0.000**	-
		Mean	-3.187 ± 0.051	-2.798 ± 0.022	-2.908 ± 0.090	-2.806 ± 0.022	-3.681 ± 0.258	-2.550 ± 0.142	8.945	**0.000**	-
Ks	B	Max	-3.790 ± 0.054	-2.880 ± 0.023	-3.571 ± 0.115	-2.908 ± 0.031	-3.250 ± 0.160	-3.198 ± 0.088	8.136	**0.000**	104
		Min	-3.821 ± 0.049	-2.812 ± 0.021	-3.667 ± 0.103	-2.827 ± 0.028	-3.069 ± 0.122	-3.246 ± 0.068	12.488	**0.000**	-
		Mean	-3.403 ± 0.070	-3.012 ± 0.030	-3.100 ± 0.086	-3.025 ± 0.025	-3.859 ± 0.397	-2.805 ± 0.217	8.503	**0.000**	-
	D	Max	-3.337 ± 0.050	-3.057 ± 0.022	-3.060 ± 0.087	-3.066 ± 0.022	-3.885 ± 0.256	-2.779 ± 0.141	9.422	**0.000**	121
		Min	-3.271 ± 0.049	-2.993 ± 0.021	-2.943 ± 0.086	-3.005 ± 0.022	-3.951 ± 0.225	-2.646 ± 0.124	15.467	**0.000**	-
		Mean	-3.287 ± 0.049	-0.035 ± 0.021	-3.009 ± 0.087	-3.044 ± 0.022	-3.849 ± 0.243	-2.748 ± 0.134	10.184	**0.000**	-

Table 8. Coefficients of the PC relation for SMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at $P = 2.5$ d.

PC		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	B	Max	0.218 ± 0.016	0.321 ± 0.007	0.171 ± 0.026	0.324 ± 0.007	0.366 ± 0.076	0.246 ± 0.041	4.473	**0.013**	104
		Min	0.154 ± 0.008	0.575 ± 0.003	0.179 ± 0.010	0.574 ± 0.003	0.142 ± 0.049	0.579 ± 0.027	3.445	**0.035**	-
		Mean	0.151 ± 0.012	0.483 ± 0.005	0.094 ± 0.018	0.493 ± 0.004	0.174 ± 0.054	0.474 ± 0.029	4.713	**0.011**	-
	D	Max	0.145 ± 0.014	0.423 ± 0.006	0.109 ± 0.027	0.426 ± 0.007	0.309 ± 0.070	0.336 ± 0.039	3.325	**0.039**	121
		Min	0.217 ± 0.006	0.598 ± 0.003	0.224 ± 0.011	0.599 ± 0.003	0.279 ± 0.035	0.563 ± 0.019	2.031	0.135	-
		Mean	0.183 ± 0.008	0.519 ± 0.004	0.176 ± 0.015	0.521 ± 0.004	0.294 ± 0.049	0.459 ± 0.027	2.497	0.086	-
$V-G$	B	Max	0.080 ± 0.005	0.075 ± 0.002	0.060 ± 0.008	0.076 ± 0.002	0.136 ± 0.027	0.047 ± 0.014	7.031	**0.001**	104
		Min	0.034 ± 0.002	0.175 ± 0.001	0.044 ± 0.004	0.174 ± 0.001	0.026 ± 0.011	0.179 ± 0.006	3.637	**0.030**	-
		Mean	0.056 ± 0.003	0.134 ± 0.001	0.039 ± 0.006	0.137 ± 0.001	0.062 ± 0.016	0.131 ± 0.008	4.273	**0.016**	-
	D	Max	0.066 ± 0.005	0.107 ± 0.002	0.054 ± 0.010	0.108 ± 0.002	0.122 ± 0.026	0.077 ± 0.014	2.841	0.062	121
		Min	0.065 ± 0.002	0.175 ± 0.001	0.077 ± 0.004	0.175 ± 0.001	0.067 ± 0.010	0.172 ± 0.005	7.867	**0.000**	-
		Mean	0.069 ± 0.003	0.145 ± 0.001	0.076 ± 0.006	0.145 ± 0.002	0.091 ± 0.014	0.132 ± 0.008	2.305	0.104	-
$V-G_{RP}$	B	Max	0.211 ± 0.014	0.330 ± 0.006	0.160 ± 0.023	0.333 ± 0.006	0.363 ± 0.069	0.253 ± 0.038	6.300	**0.002**	104
		Min	0.144 ± 0.007	0.565 ± 0.003	0.178 ± 0.009	0.564 ± 0.003	0.106 ± 0.038	0.581 ± 0.021	10.528	**0.000**	-
		Mean	0.143 ± 0.010	0.480 ± 0.004	0.095 ± 0.015	0.488 ± 0.003	0.164 ± 0.046	0.472 ± 0.025	4.527	**0.013**	-
	D	Max	0.155 ± 0.013	0.418 ± 0.005	0.124 ± 0.025	0.420 ± 0.006	0.301 ± 0.064	0.340 ± 0.035	3.068	**0.050**	121
		Min	0.187 ± 0.006	0.587 ± 0.002	0.204 ± 0.011	0.587 ± 0.003	0.228 ± 0.031	0.562 ± 0.017	3.206	**0.044**	-
		Mean	0.180 ± 0.009	0.511 ± 0.004	0.177 ± 0.014	0.512 ± 0.004	0.281 ± 0.058	0.454 ± 0.032	1.807	0.168	-
$V-Y$	B	Max	0.358 ± 0.026	0.556 ± 0.011	0.252 ± 0.037	0.563 ± 0.011	0.667 ± 0.125	0.401 ± 0.068	9.111	**0.000**	104
		Min	0.170 ± 0.012	0.999 ± 0.005	0.196 ± 0.018	0.995 ± 0.005	0.176 ± 0.061	0.994 ± 0.033	0.901	0.409	-
		Mean	0.252 ± 0.017	0.817 ± 0.007	0.169 ± 0.027	0.831 ± 0.007	0.293 ± 0.078	0.800 ± 0.042	4.674	**0.011**	-
	D	Max	0.286 ± 0.023	0.702 ± 0.010	0.230 ± 0.046	0.706 ± 0.011	0.542 ± 0.115	0.565 ± 0.063	2.937	0.056	121
		Min	0.317 ± 0.010	1.002 ± 0.004	0.340 ± 0.019	1.003 ± 0.004	0.417 ± 0.056	0.944 ± 0.030	3.064	**0.050**	-
		Mean	0.310 ± 0.013	0.869 ± 0.006	0.312 ± 0.025	0.870 ± 0.006	0.473 ± 0.071	0.778 ± 0.039	2.340	**0.100**	-
$V-Ks$	B	Max	0.466 ± 0.033	0.694 ± 0.014	0.323 ± 0.048	0.703 ± 0.014	0.886 ± 0.164	0.482 ± 0.090	9.963	**0.000**	104
		Min	0.220 ± 0.016	1.282 ± 0.007	0.253 ± 0.025	1.277 ± 0.007	0.227 ± 0.083	1.275 ± 0.045	0.827	0.440	-
		Mean	0.330 ± 0.023	1.039 ± 0.010	0.217 ± 0.036	1.057 ± 0.009	0.382 ± 0.106	1.017 ± 0.058	4.686	**0.011**	-
	D	Max	0.380 ± 0.031	0.882 ± 0.013	0.309 ± 0.061	0.887 ± 0.015	0.719 ± 0.152	0.700 ± 0.083	2.859	0.061	121
		Min	0.420 ± 0.014	1.286 ± 0.006	0.451 ± 0.025	1.287 ± 0.006	0.559 ± 0.077	1.206 ± 0.042	3.042	**0.051**	-
		Mean	0.410 ± 0.018	1.106 ± 0.008	0.413 ± 0.034	1.108 ± 0.008	0.642 ± 0.096	0.976 ± 0.053	2.606	0.078	-

Table 9. Coefficients of the AC relation for SMC FO Cepheids using convection sets B and D at mean, maximum, and minimum light. The F-test is carried out to test the break at P = 2.5 d.

		Phase	a_{all}	b_{all}	a_s	b_s	a_l	b_l	F	P(F)	
$V-I$	B	Max	-0.490 ± 0.023	0.677 ± 0.013	-0.512 ± 0.030	0.680 ± 0.019	-0.285 ± 0.033	0.588 ± 0.016	31.224	**0.000**	104
		Min	-0.075 ± 0.024	0.679 ± 0.014	-0.068 ± 0.030	0.661 ± 0.019	0.136 ± 0.030	0.590 ± 0.015	43.729	**0.000**	-
		Mean	-0.088 ± 0.026	0.593 ± 0.015	-0.124 ± 0.025	0.592 ± 0.015	0.062 ± 0.027	0.537 ± 0.014	65.360	**0.000**	-
	D	Max	-0.223 ± 0.057	0.589 ± 0.029	-0.176 ± 0.060	0.527 ± 0.030	-0.627 ± 0.049	0.831 ± 0.025	70.563	**0.000**	121
		Min	0.191 ± 0.063	0.579 ± 0.032	0.216 ± 0.060	0.520 ± 0.030	-0.189 ± 0.052	0.814 ± 0.027	88.942	**0.000**	-
		Mean	-0.302 ± 0.053	0.752 ± 0.027	-0.238 ± 0.046	0.684 ± 0.024	-0.340 ± 0.056	0.796 ± 0.029	76.242	**0.000**	-
$V-G$	B	Max	-0.155 ± 0.009	0.194 ± 0.005	-0.154 ± 0.010	0.186 ± 0.006	-0.099 ± 0.010	0.172 ± 0.005	52.425	**0.000**	104
		Min	-0.015 ± 0.005	0.198 ± 0.003	-0.019 ± 0.007	0.198 ± 0.004	0.032 ± 0.006	0.178 ± 0.003	37.363	**0.000**	-
		Mean	-0.036 ± 0.008	0.177 ± 0.005	-0.044 ± 0.009	0.174 ± 0.006	0.013 ± 0.008	0.159 ± 0.004	67.660	**0.000**	-
	D	Max	-0.066 ± 0.024	0.164 ± 0.012	-0.048 ± 0.024	0.139 ± 0.012	-0.232 ± 0.019	0.265 ± 0.009	78.838	**0.000**	121
		Min	0.076 ± 0.018	0.159 ± 0.009	0.090 ± 0.020	0.139 ± 0.010	-0.053 ± 0.014	0.237 ± 0.007	68.199	**0.000**	-
		Mean	-0.109 ± 0.018	0.230 ± 0.009	-0.100 ± 0.019	0.214 ± 0.010	-0.100 ± 0.016	0.234 ± 0.008	57.248	**0.000**	-
$V-G_{RP}$	B	Max	-0.443 ± 0.022	0.658 ± 0.012	-0.433 ± 0.027	0.641 ± 0.017	-0.260 ± 0.031	0.581 ± 0.015	35.922	**0.000**	104
		Min	-0.063 ± 0.020	0.658 ± 0.011	-0.061 ± 0.027	0.645 ± 0.017	0.108 ± 0.023	0.586 ± 0.011	81.116	**0.000**	-
		Mean	-0.088 ± 0.023	0.587 ± 0.013	-0.116 ± 0.023	0.583 ± 0.015	0.047 ± 0.024	0.537 ± 0.012	67.985	**0.000**	-
	D	Max	-0.177 ± 0.058	0.563 ± 0.029	-0.135 ± 0.060	0.503 ± 0.030	-0.572 ± 0.046	0.801 ± 0.024	75.422	**0.000**	121
		Min	0.183 ± 0.054	0.560 ± 0.027	0.214 ± 0.054	0.507 ± 0.027	-0.164 ± 0.043	0.773 ± 0.022	81.116	**0.000**	-
		Mean	-0.267 ± 0.048	0.722 ± 0.025	-0.221 ± 0.044	0.667 ± 0.023	-0.280 ± 0.049	0.751 ± 0.025	62.002	**0.000**	-
$V-J$	B	Max	-0.700 ± 0.041	1.087 ± 0.023	-0.700 ± 0.046	1.059 ± 0.029	-0.436 ± 0.045	0.983 ± 0.023	53.058	**0.000**	104
		Min	-0.109 ± 0.028	1.128 ± 0.016	-0.112 ± 0.036	1.115 ± 0.023	0.145 ± 0.039	1.018 ± 0.019	33.385	**0.000**	-
		Mean	-0.161 ± 0.041	1.009 ± 0.024	-0.201 ± 0.041	0.996 ± 0.026	0.068 ± 0.041	0.925 ± 0.022	66.708	**0.000**	-
	D	Max	-0.315 ± 0.106	0.965 ± 0.054	-0.242 ± 0.110	0.855 ± 0.055	-1.029 ± 0.083	1.396 ± 0.043	75.728	**0.000**	121
		Min	0.309 ± 0.093	0.959 ± 0.048	0.371 ± 0.089	0.371 ± 0.089	-0.321 ± 0.085	1.341 ± 0.044	83.875	**0.000**	-
		Mean	-0.458 ± 0.085	1.236 ± 0.044	-0.370 ± 0.076	1.133 ± 0.040	-0.493 ± 0.086	1.293 ± 0.045	73.895	**0.000**	-
$V-Ks$	B	Max	-0.911 ± 0.054	1.385 ± 0.031	-0.899 ± 0.061	1.336 ± 0.038	-0.575 ± 0.059	1.255 ± 0.030	52.405	**0.000**	104
		Min	-0.146 ± 0.041	1.447 ± 0.023	-0.132 ± 0.059	1.418 ± 0.037	0.201 ± 0.052	1.300 ± 0.025	29.263	**0.000**	-
		Mean	-0.205 ± 0.054	1.285 ± 0.031	-0.259 ± 0.050	1.270 ± 0.035	0.100 ± 0.050	1.173 ± 0.029	66.275	**0.000**	-
	D	Max	-0.414 ± 0.141	1.228 ± 0.072	-0.317 ± 0.147	1.083 ± 0.074	-1.360 ± 0.110	1.800 ± 0.057	74.824	**0.000**	121
		Min	0.407 ± 0.124	1.230 ± 0.064	0.491 ± 0.119	1.100 ± 0.060	-0.439 ± 0.116	1.745 ± 0.060	82.666	**0.000**	-
		Mean	-0.183 ± 0.116	1.367 ± 0.060	0.097 ± 0.134	1.142 ± 0.073	0.028 ± 0.117	1.314 ± 0.117	72.473	**0.000**	-

Table 10. Comparisons of the PC relation for the FO Cepheids in the LMC of the mathematical form M_λ = alogP+b. $|T|$, $p(t)$ represents the observed value and the probability of the t-statistics. Bold-faced entries indicate the null hypothesis (equal slopes) can be rejected.

Band	Source	a_{all}	b_{all}	σ	N	Reference	Theoretical/Empirical	$\lvert T\rvert, p(t) w.r.t$	
								Set B	Set D
$V-I$	Set B	0.108 ± 0.009	0.532 ± 0.025	0.106	86	TW	Theoretical	...	...
	Set D	0.240 ± 0.012	0.513 ± 0.007	0.119	127	TW	Theoretical	(0.910, 0.363)	...
	Obs	0.078 ± 0.006	0.530 ± 0.002	0.175	1296	TW	Empirical	(0.244, 0.806)	(1.207, 0.227)
$V-G$	Set B	0.035 ± 0.003	0.153 ± 0.001	0.095	86	TW	Theoretical	...	...
	Set D	0.076 ± 0.004	0.147 ± 0.002	0.102	127	TW	Theoretical	(0.490, 0.624)	...
	Obs	0.022 ± 0.005	0.065 ± 0.002	0.126	784	TW	Empirical	(0.049, 0.960)	(0.205, 0.837)
$V-G_{RP}$	Set B	0.103 ± 0.008	0.531 ± 0.004	0.089	86	TW	Theoretical	...	...
	Set D	0.216 ± 0.010	0.515 ± 0.001	0.093	127	TW	Theoretical	(0.842, 0.400)	...
	Obs	0.079 ± 0.010	0.469 ± 0.003	0.118	966	TW	Empirical	(0.178, 0.858)	(0.968, 0.332)
$V-J$	Set B	0.183 ± 0.014	0.892 ± 0.007	0.085	86	TW	Theoretical	...	...
	Set D	0.385 ± 0.019	0.862 ± 0.011	0.087	127	TW	Theoretical	(1.111, 0.267)	...
	Obs	0.135 ± 0.010	0.688 ± 0.003	0.087	1258	TW	Empirical	(0.309, 0.756)	(1.468, 0.142)
$V-Ks$	Set B	0.237 ± 0.018	1.132 ± 0.010	0.102	86	TW	Theoretical	...	...
	Set D	0.508 ± 0.026	1.092 ± 0.015	0.113	127	TW	Theoretical	(1.29, 0.197)	...
	Obs	0.243 ± 0.015	1.172 ± 0.005	0.164	1258	TW	Empirical	(0.033, 0.973)	(1.308, 0.190)

Table 11. Comparisons of the AC relation for the FO Cepheids in the LMC of the mathematical form M_λ = alogP+b. $|T|$, $p(t)$ represents the observed value and the probability of the t-statistics. Bold-faced entries indicate the null hypothesis (equal slopes) can be rejected.

Band	Source	a_{all}	b_{all}	σ	N	Reference	Theoretical/Empirical Set B	$\|T\|, p(t) w.r.t$ Set D	
$V-I$	Set B	0.104 ± 0.033	0.535 ± 0.016	0.106	86	TW	Theoretical	...	...
	Set D	-0.202 ± 0.076	0.742 ± 0.037	0.119	127	TW	Theoretical	(0.926, 0.355)	...
	Obs	-0.109 ± 0.017	0.589 ± 0.006	0.175	1296	TW	Empirical	(0.952, 0.340)	(0.304, 0.760)
$V-G$	Set B	0.027 ± 0.011	0.157 ± 0.005	0.095	86	TW	Theoretical	...	...
	Set D	-0.084 ± 0.024	0.230 ± 0.012	0.102	127	TW	Theoretical	(0.593, 0.553)	...
	Obs	-0.025 ± 0.010	0.082 ± 0.004	0.126	784	TW	Empirical	(0.358, 0.719)	(0.319, 0.749)
$V-G_{RP}$	Set B	0.090 ± 0.030	0.537 ± 0.015	0.089	86	TW	Theoretical	...	...
	Set D	-0.183 ± 0.068	0.721 ± 0.033	0.093	127	TW	Theoretical	(0.872, 0.384)	...
	Obs	-0.100 ± 0.022	0.530 ± 0.008	0.118	966	TW	Empirical	(0.833, 0.404)	(0.276, 0.782)
$V-J$	Set B	0.160 ± 0.058	0.904 ± 0.027	0.085	86	TW	Theoretical	...	...
	Set D	-0.299 ± 0.122	1.216 ± 0.060	0.087	127	TW	Theoretical	(1.094, 0.275)	...
	Obs	-0.138 ± 0.029	0.773 ± 0.010	0.087	1258	TW	Empirical	(1.034, 0.301)	(0.414, 0.678)
$V-Ks$	Set B	0.210 ± 0.070	1.146 ± 0.030	0.102	86	TW	Theoretical	...	...
	Set D	-0.385 ± 0.163	1.554 ± 0.080	0.113	127	TW	Theoretical	(1.230, 0.220)	...
	Obs	-0.255 ± 0.041	1.329 ± 0.014	0.164	1258	TW	Empirical	(1.389, 0.164)	(0.287, 0.773)

Table 12. Comparisons of the PC relation for the FO Cepheids in the SMC of the mathematical form M_λ = alogP+b. $|T|$, $p(t)$ represents the observed value and the probability of the t-statistics. Bold-faced entries indicate the null hypothesis (equal slopes) can be rejected.

Band	Source	a_{all}	b_{all}	σ	N	Reference	Theoretical/Empirical Set B	$\|T\|, p(t) w.r.t$ Set D	
$V-I$	Set B	0.151 ± 0.012	0.483 ± 0.005	0.106	104	TW	Theoretical	...	...
	Set D	0.183 ± 0.008	0.519 ± 0.004	0.119	121	TW	Theoretical	(0.226, 0.821)	...
	Obs	0.160 ± 0.007	0.485 ± 0.002	0.175	1550	TW	Empirical	(0.065, 0.473)	(0.187, 0.425)
$V-G$	Set B	0.056 ± 0.003	0.134 ± 0.001	0.095	104	TW	Theoretical	...	...
	Set D	0.069 ± 0.003	0.145 ± 0.001	0.102	121	TW	Theoretical	(0.167, 0.866)	...
	Obs	0.040 ± 0.004	0.064 ± 0.001	0.126	1182	TW	Empirical	(0.191, 0.424)	(0.346, 0.364)
$V-G_{RP}$	Set B	0.143 ± 0.010	0.480 ± 0.004	0.089	104	TW	Theoretical	...	...
	Set D	0.180 ± 0.009	0.511 ± 0.004	0.093	121	TW	Theoretical	(0.268, 0.788)	...
	Obs	0.164 ± 0.010	0.421 ± 0.002	0.118	1162	*TW*	Empirical	(0.148, 0.440)	(0.116, 0.453)
$V-Y$	Set B	0.252 ± 0.017	0.817 ± 0.007	0.085	104	TW	Theoretical	...	...
	Set D	0.310 ± 0.013	0.869 ± 0.006	0.087	121	*TW*	Theoretical	(0.334, 0.738)	...
	Obs	0.284 ± 0.016	0.843 ± 0.003	0.087	1380	TW	Empirical	(0.176, 0.430)	(0.152, 0.439)
$V-Ks$	Set B	0.330 ± 0.023	1.039 ± 0.010	0.102	104	TW	Theoretical	...	...
	Set D	0.410 ± 0.018	1.106 ± 0.008	0.113	121	TW	Theoretical	(0.395, 0.693)	...
	Obs	0.409 ± 0.019	1.068 ± 0.004	0.164	1380	TW	Empirical	(0.385, 0.349)	(0.005, 0.497)

Table 13. Comparisons of the AC relation for the FO Cepheids in the SMC of the mathematical form M_λ = alogP+b. $|T|$, $p(t)$ represents the observed value and the probability of the t-statistics. Bold-faced entries indicate the null hypothesis (equal slopes) can be rejected.

Band	Source	a_{all}	b_{all}	σ	N	Reference	Theoretical/Empirical Set B	$\|T\|, p(t) w.r.t$ Set D	
$V-I$	Set B	-0.088 ± 0.026	0.593 ± 0.015	0.106	104	TW	Theoretical	...	...
	Set D	-0.302 ± 0.053	0.752 ± 0.027	0.119	121	TW	Theoretical	(0.761, 0.447)	...
	Obs	-0.236 ± 0.010	0.618 ± 0.005	0.175	1550	TW	Empirical	(0.780, 0.435)	(0.262950.792)
$V-G$	Set B	-0.036 ± 0.008	0.177 ± 0.005	0.095	104	TW	Theoretical	...	...
	Set D	-0.109 ± 0.018	0.230 ± 0.009	0.102	121	TW	Theoretical	(0.452, 0.651)	...
	Obs	-0.046 ± 0.005	0.090 ± 0.002	0.126	1182	TW	Empirical	(0.087, 0.930)	(0.415, 0.677)
$V-G_{RP}$	Set B	-0.088 ± 0.023	0.587 ± 0.013	0.089	104	TW	Theoretical	...	...
	Set D	-0.267 ± 0.048	0.722 ± 0.025	0.093	121	TW	Theoretical	(0.671, 0.502)	...
	Obs	-0.175 ± 0.014	0.526 ± 0.007	0.118	1162	TW	Empirical	(0.452, 0.651)	(0.369, 0.711)
$V-Y$	Set B	-0.161 ± 0.041	1.009 ± 0.024	0.085	104	TW	Theoretical	...	...
	Set D	-0.458 ± 0.085	1.236 ± 0.044	0.087	121	TW	Theoretical	(0.836, 0.403)	...
	Obs	-0.370 ± 0.023	1.052 ± 0.010	0.087	1380	TW	Empirical	(0.826, 0.408)	(0.267, 0.788)
$V-Ks$	Set B	-0.205 ± 0.054	1.285 ± 0.031	0.102	104	TW	Theoretical	...	...
	Set D	-0.183 ± 0.116	1.367 ± 0.060	0.113	121	TW	Theoretical	(0.053, 0.957)	...
	Obs	-0.508 ± 0.028	1.358 ± 0.013	0.164	1380	TW	Empirical	(1.058, 0.290)	(0.856, 0.391)