

## Appendix 13B: TIMSS Advanced 2015 Physics Item Parameters from Concurrent Calibration

**TIMSS Advanced 2015 Physics Item Parameters from Concurrent Calibration**

Item		Slope ( $a_j$ )	Location ( $b_j$ )	Guessing ( $c_j$ )	Step 1 ( $d_{j1}$ )	Step 2 ( $d_{j2}$ )
<b>Items Released in 2008:</b>						
P1_01	PA13001	0.670 (0.099)	0.478 (0.173)	0.337 (0.052)		
P1_02	PA13002	1.089 (0.110)	0.451 (0.076)	0.304 (0.032)		
P1_03	PA13003	1.059 (0.094)	0.114 (0.082)	0.253 (0.037)		
P1_04	PA13004	0.578 (0.056)	-1.001 (0.231)	0.199 (0.079)		
P1_05	PA13005	0.720 (0.088)	-0.266 (0.205)	0.352 (0.066)		
P1_06	PA13006	1.047 (0.183)	1.676 (0.099)	0.283 (0.020)		
P1_09	PA13009	0.877 (0.143)	1.571 (0.096)	0.234 (0.024)		
P3_01	PA13021	0.812 (0.090)	0.644 (0.087)	0.190 (0.035)		
P3_02	PA13022	0.693 (0.026)	1.214 (0.036)		-0.890 (0.065)	0.890 (0.077)
P3_03	PA13023	0.635 (0.038)	0.030 (0.045)			
P3_04	PA13024	0.671 (0.027)	1.093 (0.036)		-0.466 (0.056)	0.466 (0.068)
P3_05	PA13025	0.589 (0.024)	1.267 (0.043)		-0.815 (0.070)	0.815 (0.085)
P3_06	PA13026	1.051 (0.076)	1.817 (0.080)			
P3_07A	PA13027A	0.834 (0.053)	1.234 (0.057)			
P6_01	PA23050	1.010 (0.201)	1.148 (0.109)	0.330 (0.035)		
P6_02	PA23056	0.441 (0.085)	-0.032 (0.385)	0.273 (0.091)		
P6_03	PA23142	1.231 (0.169)	0.727 (0.078)	0.261 (0.033)		
P6_04	PA23072	0.677 (0.053)	0.352 (0.057)			
P6_05	PA23022	0.473 (0.027)	1.702 (0.087)		-1.701 (0.150)	1.701 (0.179)
P6_06	PA23030	1.727 (0.253)	1.395 (0.058)	0.111 (0.015)		
P6_07	PA23078	0.320 (0.043)	0.870 (0.139)			
P6_08	PA23113	0.880 (0.184)	1.268 (0.122)	0.284 (0.038)		
P6_09	PA23128	0.454 (0.047)	0.874 (0.100)			
P6_10	PA23058	1.163 (0.167)	0.767 (0.084)	0.267 (0.034)		
P6_11	PA23115	1.365 (0.196)	1.171 (0.063)	0.165 (0.022)		
P7_01	PA23110	0.651 (0.124)	0.897 (0.169)	0.233 (0.055)		
P7_02	PA23014	0.570 (0.049)	0.190 (0.067)			
P7_03	PA23025	0.779 (0.040)	1.323 (0.047)		-0.831 (0.088)	0.831 (0.104)
P7_04	PA23028	1.024 (0.142)	0.626 (0.098)	0.247 (0.041)		
P7_05	PA23034	0.448 (0.050)	1.293 (0.128)			
P7_06	PA23044	0.795 (0.067)	1.328 (0.080)			

**TIMSS Advanced 2015 Physics Item Parameters from Concurrent Calibration (Continued)**

P7_07	PA23082	0.719 (0.055)	0.169 (0.055)		
P7_08	PA23140	0.687 (0.138)	1.328 (0.140)	0.194 (0.044)	
P7_09	PA23084	0.752 (0.038)	1.297 (0.045)		-1.635 (0.136) 1.635 (0.146)
P7_10	PA23059	0.587 (0.083)	-0.666 (0.286)	0.258 (0.087)	
P7_11	PA23138	1.436 (0.198)	0.302 (0.096)	0.429 (0.040)	
P7_12	PA23137	0.591 (0.052)	0.674 (0.070)		
<b>Items Common in 2008 and 2015:</b>					
P1_01	PA13011	0.301 (0.057)	0.750 (0.411)	0.230 (0.077)	
P1_02	PA13012	1.392 (0.110)	1.357 (0.037)	0.099 (0.009)	
P1_03	PA13013	0.914 (0.112)	1.525 (0.072)	0.240 (0.017)	
P1_04	PA13014	0.896 (0.069)	0.512 (0.059)	0.201 (0.024)	
P1_05	PA13015	0.903 (0.116)	0.616 (0.105)	0.555 (0.025)	
P1_06	PA13016	1.132 (0.097)	1.341 (0.045)	0.124 (0.012)	
P1_07	PA13017	0.301 (0.043)	0.276 (0.360)	0.189 (0.069)	
P1_08	PA13018	0.633 (0.082)	1.147 (0.097)	0.254 (0.030)	
P1_09	PA13019	0.521 (0.080)	1.626 (0.117)	0.178 (0.031)	
P3_01	PA23071	0.674 (0.140)	1.595 (0.139)	0.470 (0.025)	
P3_02	PA23146	0.665 (0.028)	-0.170 (0.033)		
P3_03	PA23029	1.108 (0.066)	0.424 (0.038)	0.127 (0.017)	
P3_04	PA23104	0.725 (0.082)	0.723 (0.094)	0.301 (0.030)	
P3_05	PA23038	0.788 (0.061)	0.628 (0.058)	0.138 (0.022)	
P3_06	PA23041	0.584 (0.026)	-0.584 (0.043)		
P3_07	PA23053	0.509 (0.016)	0.589 (0.028)		-0.403 (0.051) 0.403 (0.057)
P3_08	PA23148	0.446 (0.055)	-0.054 (0.254)	0.254 (0.062)	
P3_09	PA23119	0.484 (0.014)	1.508 (0.044)		-1.893 (0.088) 1.893 (0.101)
P3_10	PA23088	0.726 (0.029)	-0.081 (0.030)		
P3_11	PA23066	0.699 (0.030)	0.636 (0.035)		
P5_01	PA23048	0.616 (0.064)	-0.638 (0.226)	0.390 (0.062)	
P5_02	PA23039	0.797 (0.091)	1.266 (0.070)	0.220 (0.021)	
P5_03	PA23035	0.830 (0.032)	0.104 (0.027)		
P5_04	PA23042	0.857 (0.108)	1.127 (0.077)	0.349 (0.023)	
P5_05	PA23012	0.841 (0.039)	1.308 (0.047)		
P5_06 *	PA23131	0.984 (0.160)	1.606 (0.093)	0.253 (0.022)	
P5_07	PA23051	0.982 (0.037)	0.504 (0.025)		
P5_08	PA23085	0.882 (0.117)	1.391 (0.077)	0.309 (0.020)	
P5_09	PA23130	0.502 (0.014)	1.102 (0.033)		-1.489 (0.071) 1.489 (0.080)
P5_10	PA23086	0.535 (0.030)	1.284 (0.067)		
P5_11	PA23064	0.784 (0.078)	0.643 (0.081)	0.264 (0.029)	

\* Item P5\_06 is not included in the TIMSS Advanced 2015 Physics Framework. All responses to the item in the 2015 assessment were set to Not Administered.

**TIMSS Advanced 2015 Physics Item Parameters from Concurrent Calibration (Continued)**

Items Introduced in 2015:						
P2_01A	PA33061A	1.223 (0.118)	0.664 (0.051)	0.096 (0.019)		
P2_01B	PA33061B	0.639 (0.042)	-0.037 (0.053)			
P2_02	PA33004	0.749 (0.049)	0.679 (0.058)			
P2_03	PA33044	0.487 (0.131)	1.771 (0.218)	0.161 (0.048)		
P2_04	PA33075	0.623 (0.042)	0.248 (0.057)			
P2_05A	PA33102A	0.284 (0.032)	-1.777 (0.203)			
P2_05B	PA33102B	0.366 (0.034)	-0.168 (0.087)			
P2_06	PA33121	0.990 (0.172)	0.958 (0.102)	0.358 (0.029)		
P2_07	PA33115	1.070 (0.126)	0.765 (0.067)	0.165 (0.024)		
P2_08	PA33005	0.631 (0.041)	-0.509 (0.058)			
P2_09A	PA33101A	0.647 (0.090)	0.181 (0.158)	0.185 (0.054)		
P2_09B	PA33101B	0.492 (0.053)	2.319 (0.229)			
P4_01	PA33078	0.701 (0.078)	0.310 (0.098)	0.082 (0.036)		
P4_02	PA33088	1.149 (0.099)	-0.122 (0.064)	0.140 (0.029)		
P4_03	PA33058	0.462 (0.019)	0.200 (0.044)		-1.190 (0.104)	1.190 (0.109)
P4_04	PA33057	0.870 (0.122)	0.835 (0.089)	0.192 (0.029)		
P4_05	PA33047	0.567 (0.067)	2.686 (0.281)			
P4_06	PA33012	0.892 (0.127)	1.050 (0.087)	0.159 (0.025)		
P4_07	PA33120	0.862 (0.153)	1.326 (0.110)	0.178 (0.027)		
P4_08A	PA33079A	0.802 (0.124)	0.894 (0.103)	0.217 (0.032)		
P4_08B	PA33079B	0.828 (0.051)	0.524 (0.051)			
P4_09	PA33116	0.986 (0.114)	0.497 (0.076)	0.185 (0.028)		
P4_10	PA33070	0.591 (0.039)	-0.716 (0.064)			
P4_11	PA33011	0.466 (0.037)	0.041 (0.072)			
P6_01	PA33059	0.581 (0.106)	-0.300 (0.315)	0.351 (0.083)		
P6_02	PA33073	0.481 (0.025)	0.027 (0.043)		-0.177 (0.084)	0.177 (0.087)
P6_03	PA33019	1.282 (0.244)	1.429 (0.097)	0.250 (0.018)		
P6_04	PA33015	0.650 (0.113)	0.752 (0.141)	0.216 (0.045)		
P6_05	PA33086	0.782 (0.129)	0.904 (0.110)	0.226 (0.035)		
P6_06	PA33035	0.315 (0.033)	-0.232 (0.100)			
P6_07	PA33119	0.558 (0.035)	2.005 (0.112)		-1.533 (0.155)	1.533 (0.201)
P6_08	PA33046	0.765 (0.048)	0.229 (0.048)			
P6_09	PA33083	0.715 (0.092)	0.061 (0.139)	0.186 (0.050)		
P6_10	PA33069	0.728 (0.046)	-0.994 (0.063)			
P6_11	PA33114	0.559 (0.106)	-0.218 (0.326)	0.338 (0.085)		
P6_12	PA33080	0.832 (0.056)	0.871 (0.062)			

**TIMSS Advanced 2015 Physics Item Parameters from Concurrent Calibration (Continued)**

P7_01	PA33065	0.936 (0.174)	0.876 (0.114)	0.382 (0.032)		
P7_02A	PA33009A	0.693 (0.032)	1.099 (0.050)		-0.811 (0.083)	0.811 (0.102)
P7_02B	PA33009B	0.895 (0.116)	0.527 (0.090)	0.200 (0.034)		
P7_03	PA33002	0.725 (0.113)	-0.498 (0.248)	0.411 (0.071)		
P7_04	PA33098	0.769 (0.135)	0.991 (0.116)	0.236 (0.035)		
P7_05A	PA33028A	0.545 (0.023)	0.811 (0.047)		-1.434 (0.108)	1.434 (0.120)
P7_05B	PA33028B	0.730 (0.097)	0.051 (0.146)	0.217 (0.052)		
P7_06A	PA33054A	1.312 (0.290)	1.551 (0.114)	0.304 (0.018)		
P7_06B	PA33054B	0.866 (0.065)	1.351 (0.086)			
P7_07	PA33040	0.475 (0.113)	0.316 (0.359)	0.295 (0.089)		
P7_08A	PA33095A	0.720 (0.047)	-1.107 (0.067)			
P7_08B	PA33095B	0.671 (0.105)	0.466 (0.146)	0.207 (0.050)		
P8_01A	PA33066A	0.686 (0.198)	1.422 (0.197)	0.410 (0.038)		
P8_01B	PA33066B	0.823 (0.131)	-0.175 (0.190)	0.466 (0.053)		
P8_02	PA33090	0.383 (0.022)	0.796 (0.070)		-0.603 (0.105)	0.603 (0.127)
P8_03A	PA33064A	0.323 (0.034)	0.233 (0.106)			
P8_03B	PA33064B	0.552 (0.027)	1.355 (0.070)		-1.079 (0.105)	1.079 (0.133)
P8_04	PA33110	0.335 (0.119)	-0.607 (1.247)	0.352 (0.213)		
P8_05	PA33118	0.465 (0.153)	1.582 (0.264)	0.281 (0.061)		
P8_06	PA33109	0.755 (0.090)	0.202 (0.110)	0.149 (0.041)		
P8_07	PA33029	0.488 (0.077)	0.512 (0.171)	0.050 (0.057)		
P8_08	PA33097	0.595 (0.041)	-0.575 (0.061)			
P8_09	PA33099	0.684 (0.124)	0.666 (0.152)	0.292 (0.046)		
P8_10	PA33008	0.209 (0.017)	-0.795 (0.101)		-0.694 (0.197)	0.694 (0.181)
P9_02	PA33072	0.440 (0.036)	-0.932 (0.094)			
P9_03	PA33063	1.187 (0.198)	0.792 (0.091)	0.414 (0.027)		
P9_04	PA33077	0.623 (0.025)	0.501 (0.037)		-1.007 (0.085)	1.007 (0.092)
P9_05A	PA33111A	0.642 (0.026)	0.509 (0.036)		-0.936 (0.082)	0.936 (0.089)
P9_05B	PA33111B	0.900 (0.153)	0.910 (0.106)	0.277 (0.034)		
P9_06	PA33003	0.813 (0.109)	-0.831 (0.224)	0.384 (0.075)		
P9_07	PA33081	0.963 (0.192)	1.259 (0.114)	0.324 (0.027)		
P9_08	PA33045	0.512 (0.128)	0.566 (0.310)	0.358 (0.075)		
P9_09A	PA33094A	0.419 (0.039)	0.837 (0.108)			
P9_09B	PA33094B	0.628 (0.146)	1.208 (0.169)	0.282 (0.046)		
P9_09C	PA33094C	0.848 (0.048)	1.263 (0.052)		-0.098 (0.060)	0.098 (0.088)