

Proposal for an Integrated System of Photometry

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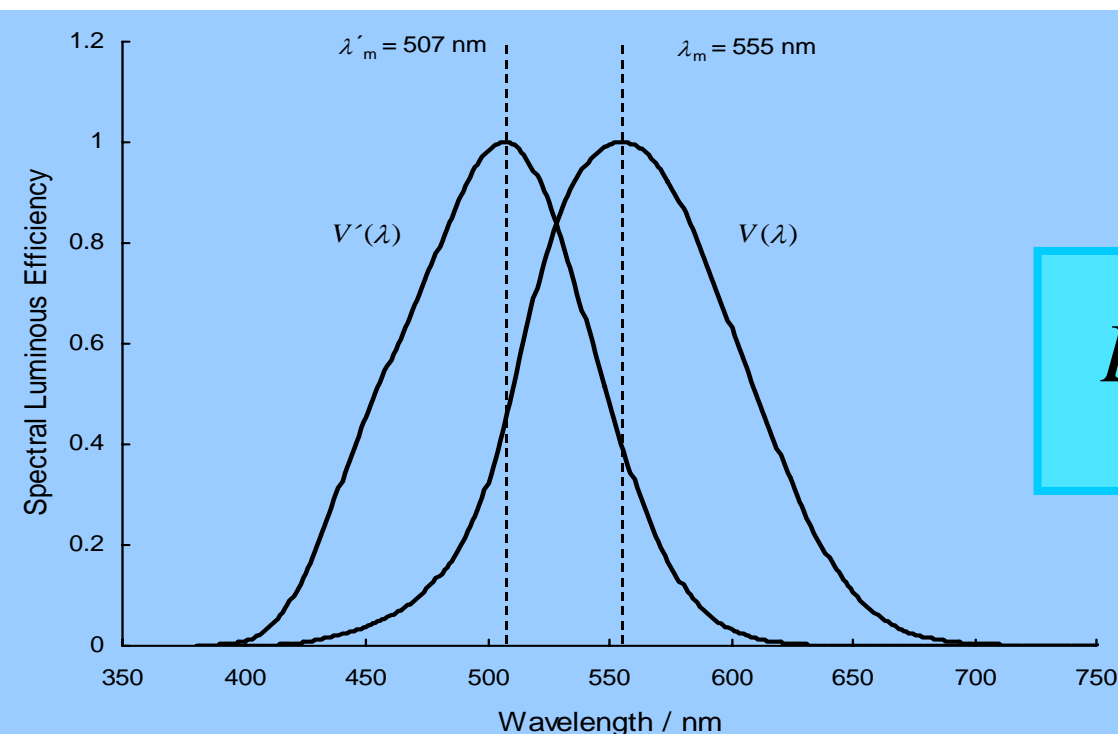
Two systems of photometry have recently been proposed

Both bridge the gap between the photopic and scotopic regions using a function of the form:

$$V_{mes} = xV(\lambda) + (1-x)V'(\lambda)$$

Both systems are additive

$$L = K_m \int L_{e,\lambda} V(\lambda) d\lambda$$



The scientific basis for the 2 systems is different

LRC 'X' system

- Achromatic tasks (to ensure additivity)
- Small number of observers (to minimise 'noise')

⇒ Detailed algorithms for calculating luminance / illuminance are different

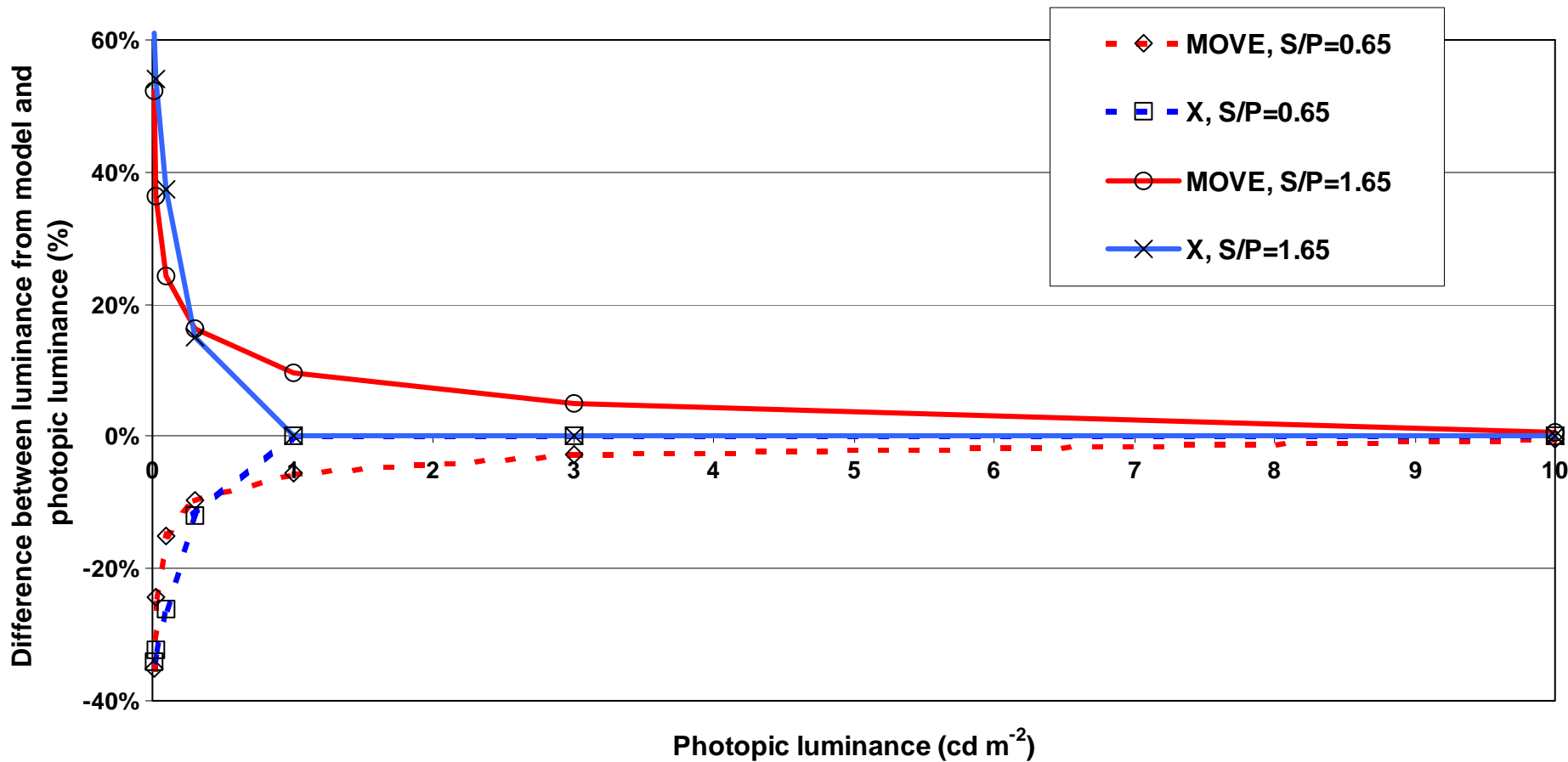
'MOVE' system

- Achromatic and chromatic tasks (to maximise applicability)
- Large number of observers (to minimise effects of inter-observer variability)

Despite the differences in approach, the results are very similar for most 'practical' light sources

S/P	0.01	0.03	0.1	0.3	1	3	10
0.45	-2%	19%	29%	6%	-9%	-5%	-1%
0.65	-2%	11%	14%	2%	-6%	-3%	0%
0.85	0%	4%	5%	1%	-2%	-1%	0%
1.15	0%	-4%	-3%	0%	2%	1%	0%
1.35	-2%	-8%	-7%	0%	5%	3%	0%
1.55	-5%	-11%	-9%	1%	8%	4%	1%
1.75	-6%	-13%	-11%	2%	11%	6%	1%
1.95	-8%	-16%	-12%	3%	13%	7%	1%
2.15	-10%	-17%	-13%	4%	15%	8%	1%

Difference in calculated luminance for the 2 systems



Differences from
photopic luminance

The similarity in these 2 measurement systems and results, despite their different starting points, offers a real possibility for an effective and practical solution:

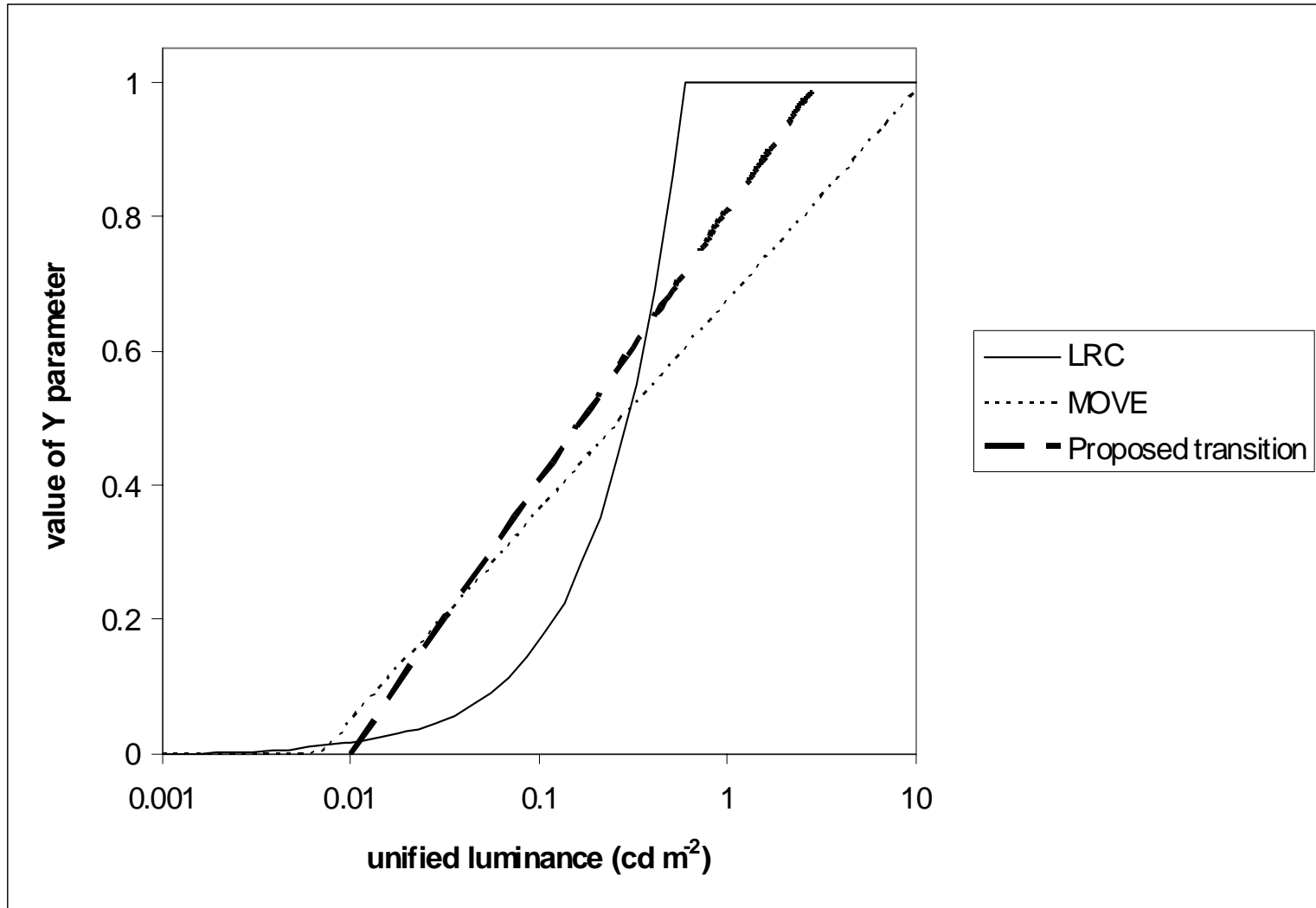
An Integrated System for Photometry

No system can ever hope to provide a complete prediction of visual performance for all tasks and lighting conditions.

Photometry allows 'light' to be measured in a precise, reproducible, way with some correlation with visual effect.

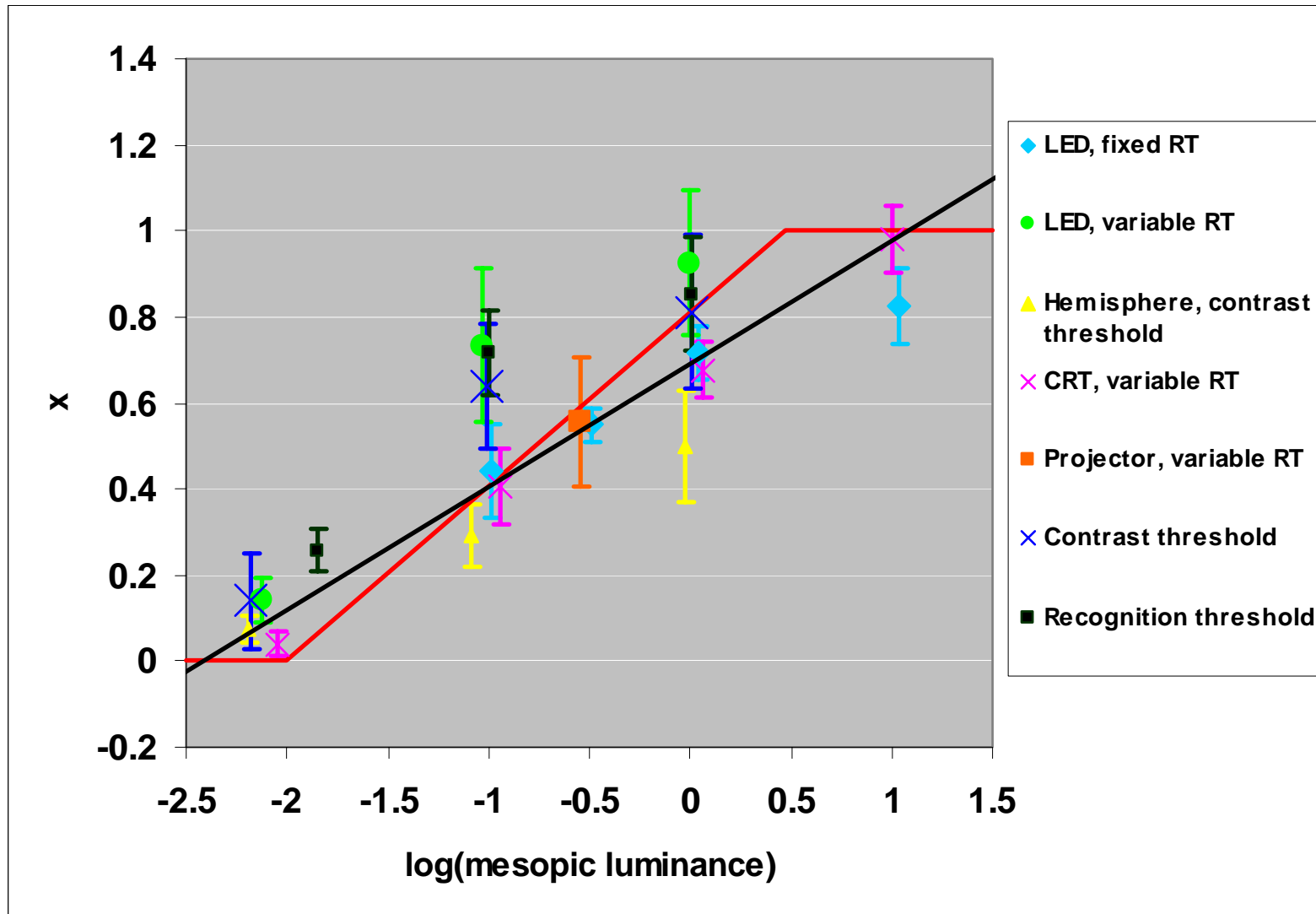
$V(\lambda)$ has stood the test of time, despite limitations!

An Integrated system of photometry?



$$V_{\text{mes}} = y V(\lambda) + (1-y) V'(\lambda)$$

Integrated System and MOVE data



Results of Integrated System

