



antiferroelectric and V-shaped materials

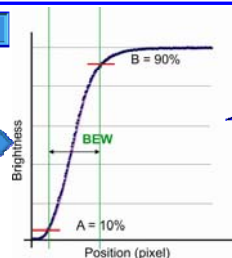
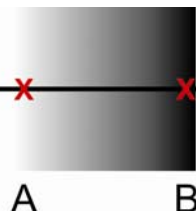
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CAUSED BY:

- ✓ Slow LC response time.
- ✓ **Excitation & Hold** temporal rendering method of LCDs.
- ✓ Smooth pursuit eye movement of the human visual system.

WHAT IS MOTION BLUR?



The basic parameter is the **Brightness Edge Width BEW**

Some Maths:

$$N - BEW (\text{frame}) = \frac{BEW (\text{pixel})}{v (\text{pixel/frame})}$$

$$N - BET (\text{seconds}) = N - BEW (\text{frame}) \cdot T_f (\text{seconds/frame})$$

✓MPRT is an objective and quantitative parameter proposed for standard characterization of Motion Blur artifact, and quantification of the visual perception of moving images.

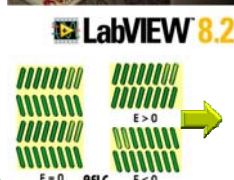
✓Grey to Grey (G2G) Response Time Curves (RTC) must be taken into account to measure MPRT.

N Gray Levels

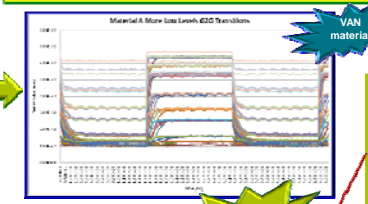


M = N(N-1) Transitions

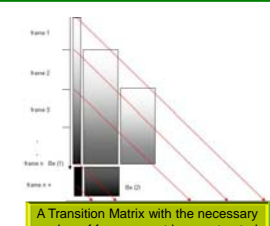
$$MPRT (\text{seconds}) = \frac{1}{M} \sum_{i=1}^{M} N - BET_i$$



OUR PROPOSAL FOR MEASURING MPRT:



New transition curves must be defined. All the response time curves are rising curves starting from zero but coming from different initial grey levels (L_i) before **Saturation Pulse**.



A Transition Matrix with the necessary number of frames must be constructed.

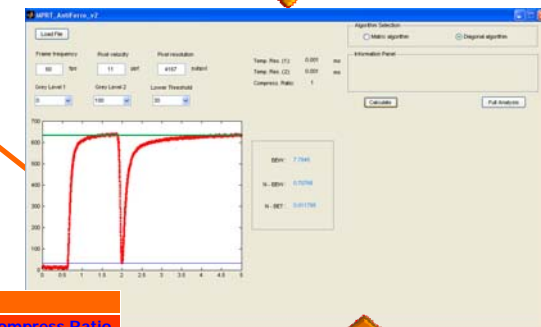
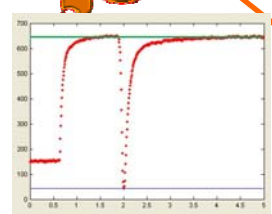
At least two frames must be taken into account to construct the matrix and in the case of **V-Shaped Smectic** materials we have captured 5000 samples in 5 ms, it means we will have a bigger than 40000 x 40000 matrix.

MPRT₀

TWO DIFFERENT METHODS

We can promediate the samples to compress the curves ...

We can use an **Algorithm** to calculate the diagonals of the unconstructed matrix



Compression Method		
MPRT (ms)	Vp (ppf)	Compress Ratio
0,01012	4	10,418
0,01068	5	10,418
0,01104	6	10,418
0,01130	7	10,418
0,01149	8	10,418
0,01164	9	11,906
0,01179	10	13,89

The difference in the numerical values obtained is remarkable from the fifth decimal

Algorithm Method	
MPRT (ms)	Vp (ppf)
0,01010	4
0,01066	5
0,01103	6
0,01129	7
0,01149	8
0,01162	9
0,01170	10

[1] Y. Igarashi, T. Yamamoto, Y. Tanaka, J. Someya, Y. Nakakura, M. Yamakawa, Y. Nishida, T. Kurita. SID'04 Digest of Technical Papers. 2004, 1262-1265.
 [2] Michael E. Becker. Journal of the SID. 2008, 16/10, 989-1000
 [3] W. Song, X. Li, Y. Zhang, Y. Qi, X. Yang. Journal of the SID. 2008, 16/5, 587-593.

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