INTERFERENCE FILTER TESTING FOR COLOR MEASUREMENT ACCURACY

Display Forum '97
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NIST FLAT PANEL DISPLAY LABORATORY
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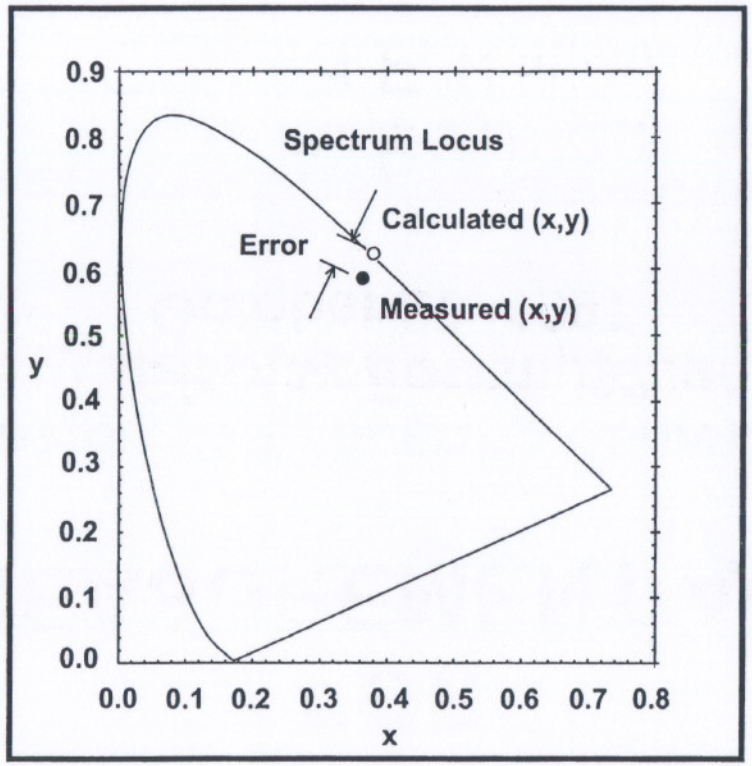
INTERFERENCE FILTERS CAN REVEAL INSTRUMENT PERFORMANCE



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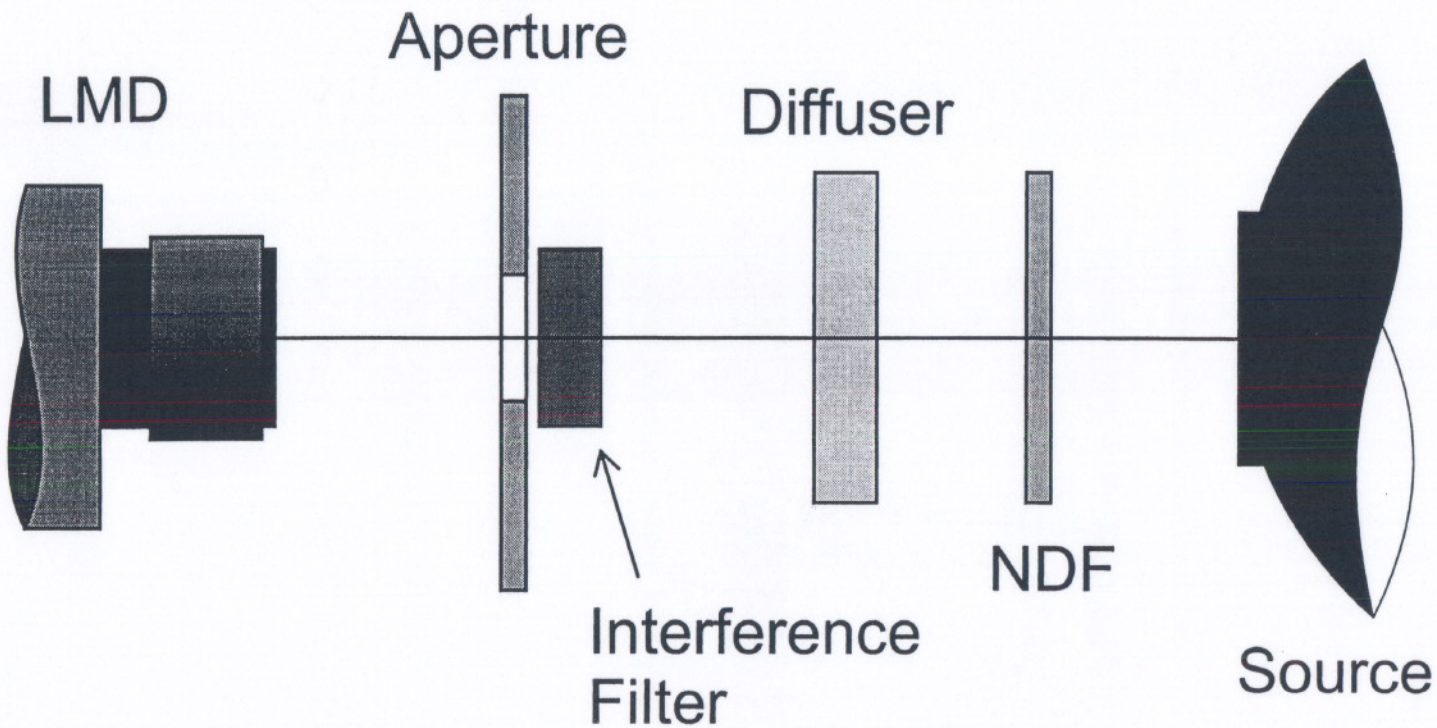
MEASUREMENT APPARATUS



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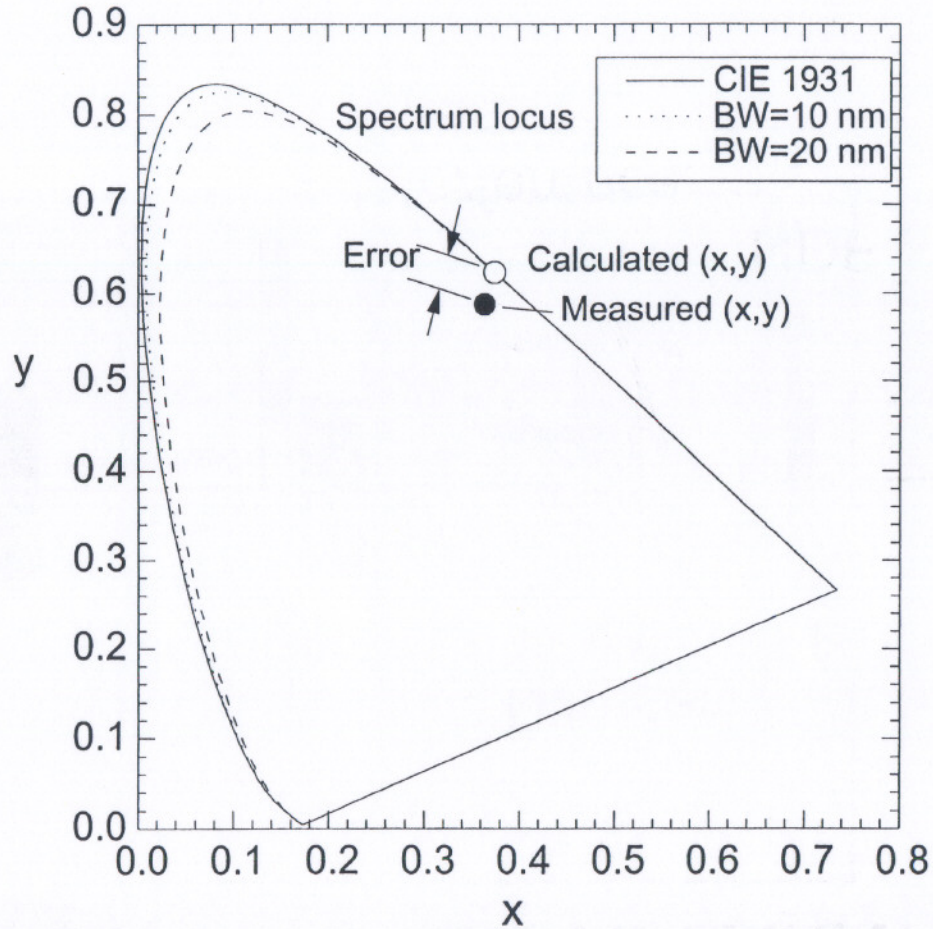
BANDWIDTH VARIATION



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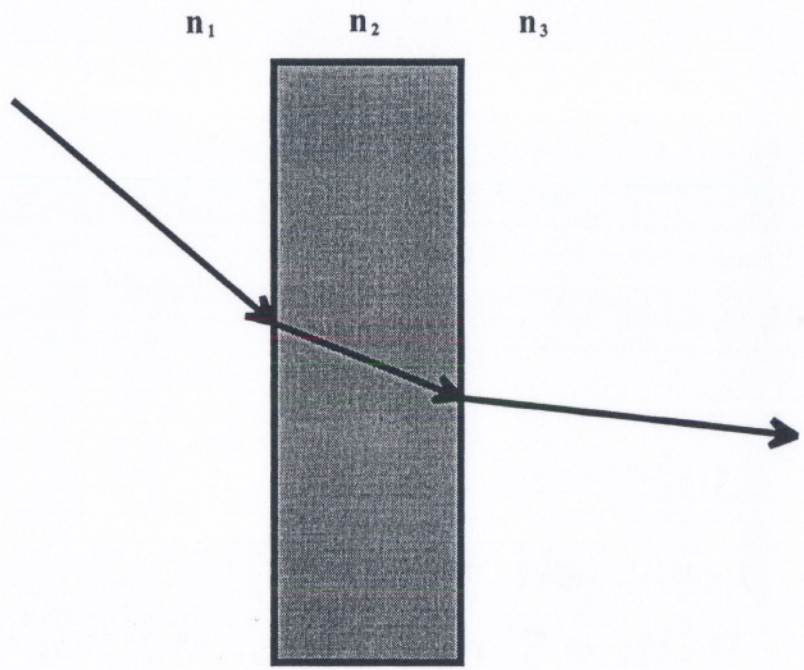
MISALIGNMENT

$$\lambda_\theta = \lambda_0 \left[1 - (n_1/n_2)^2 \sin^2\theta \right]^{1/2}$$



optical thickness = nt

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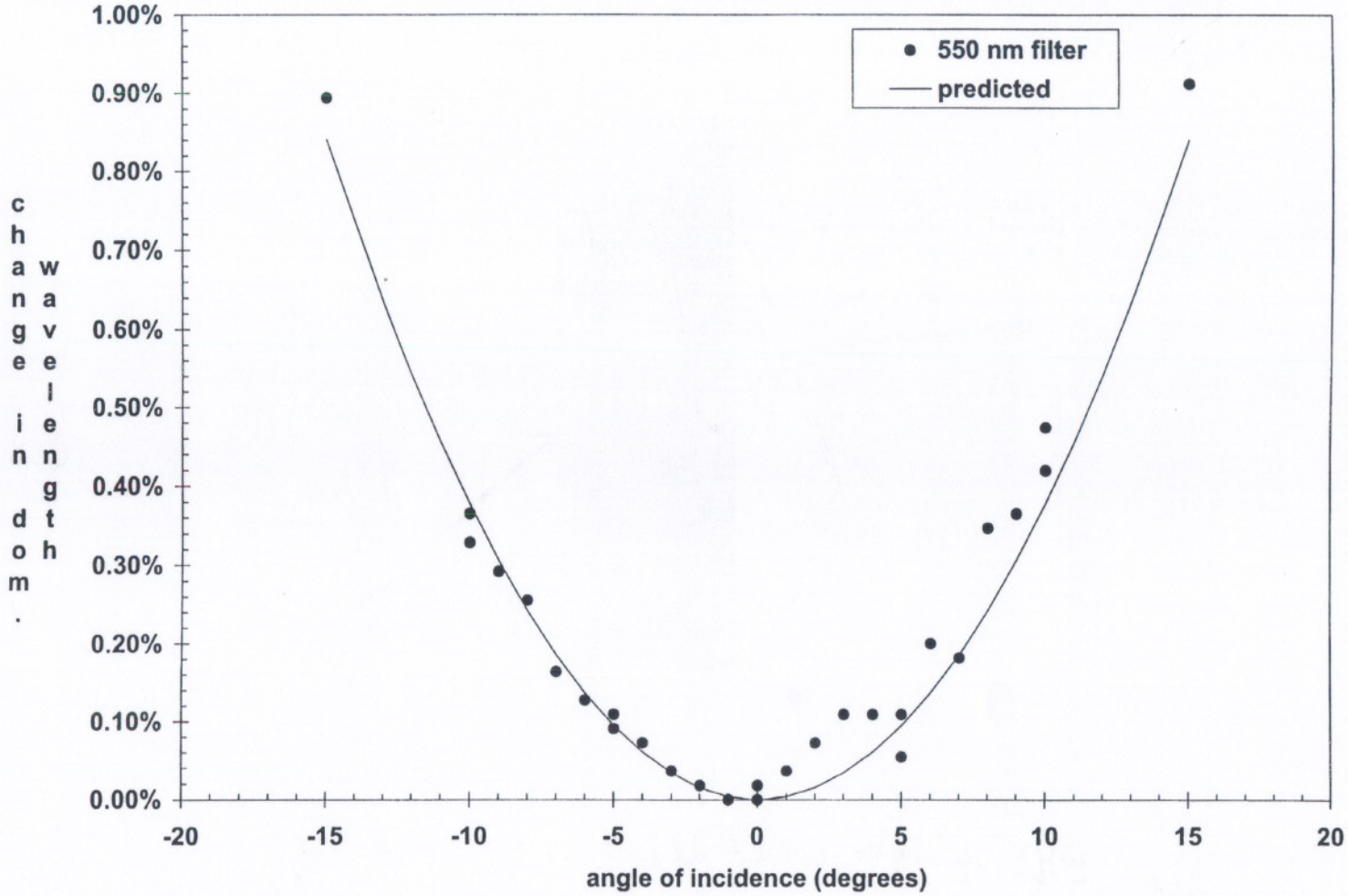
EFFECTS OF ALIGNMENT AND REFLECTION



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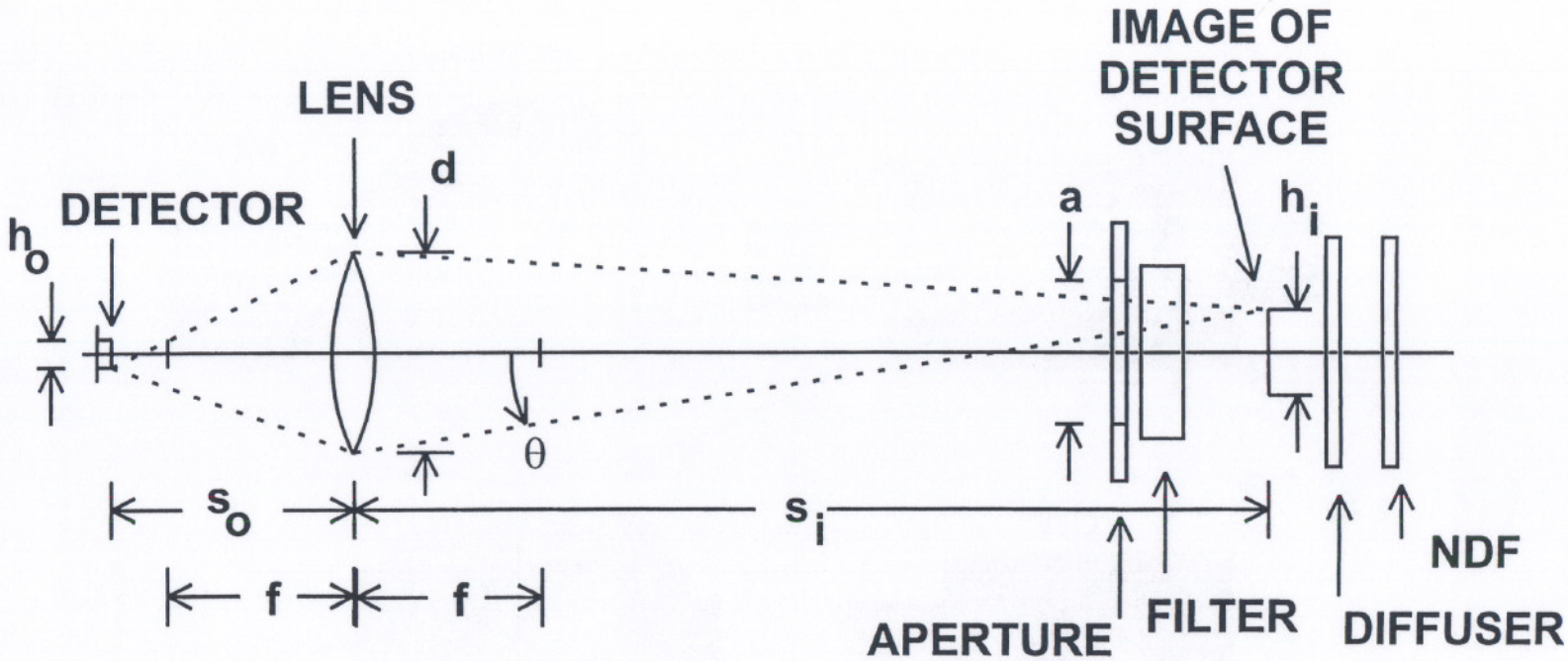
DIVERGENT ILLUMINATION



$$1/f = 1/s_o + 1/s_i$$

$$\theta = \arctan[1/s_i(h_i/2 + d/2)]$$

$$\lambda_\theta = \lambda_0 \, [\, 1 - (n_1/n_2)^2 \sin^2\theta]^{1/2}$$

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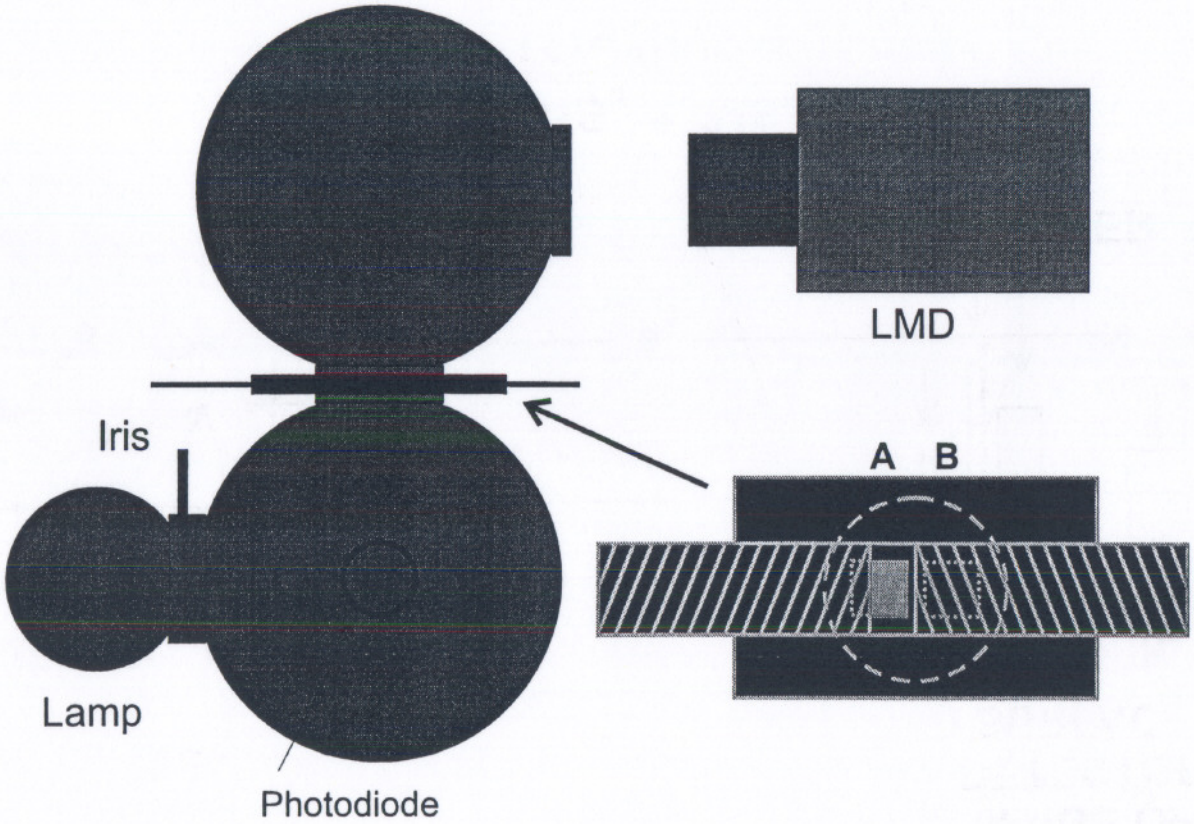
CHECKING LINEARITY



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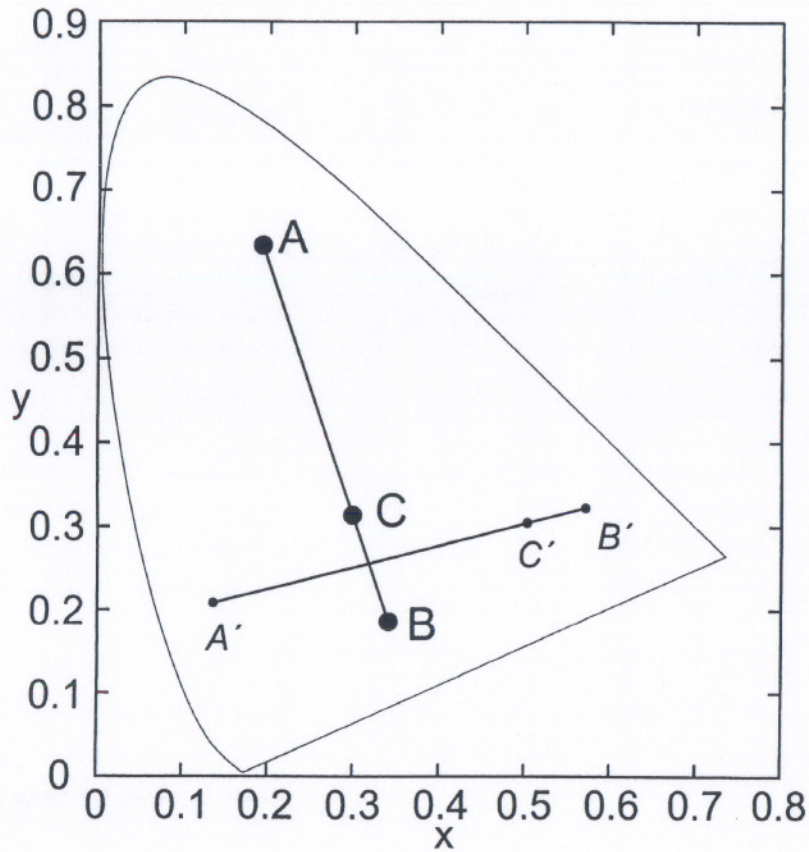
CHECKING LINEARITY



$$x'_C = x_A + k(x_B - x_A)$$

$$y'_C = y_A + k(y_B - y_A)$$

$$k = [1 + (y_B L_A / y_A L_B)]^{-1}$$

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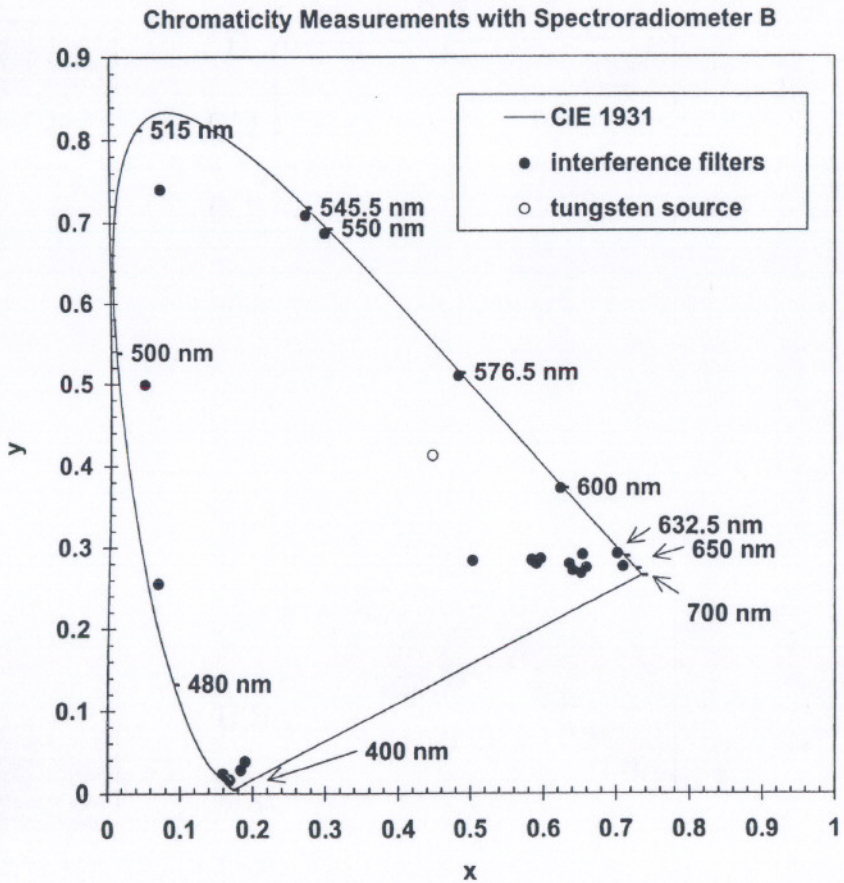
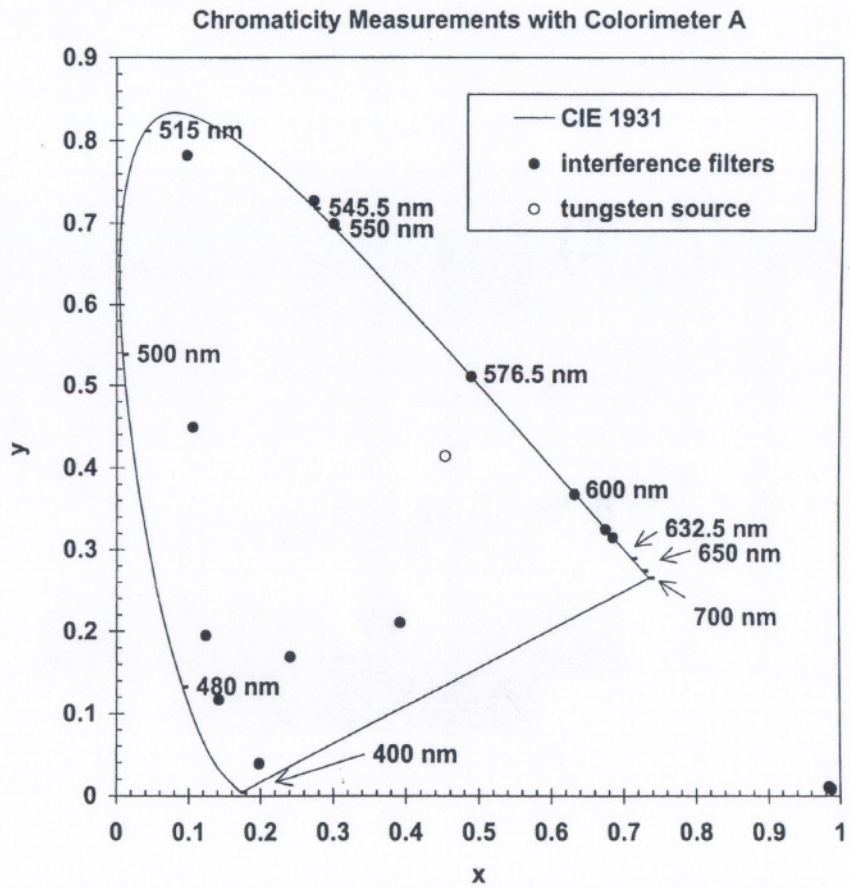
UNEXPECTED BEHAVIOR





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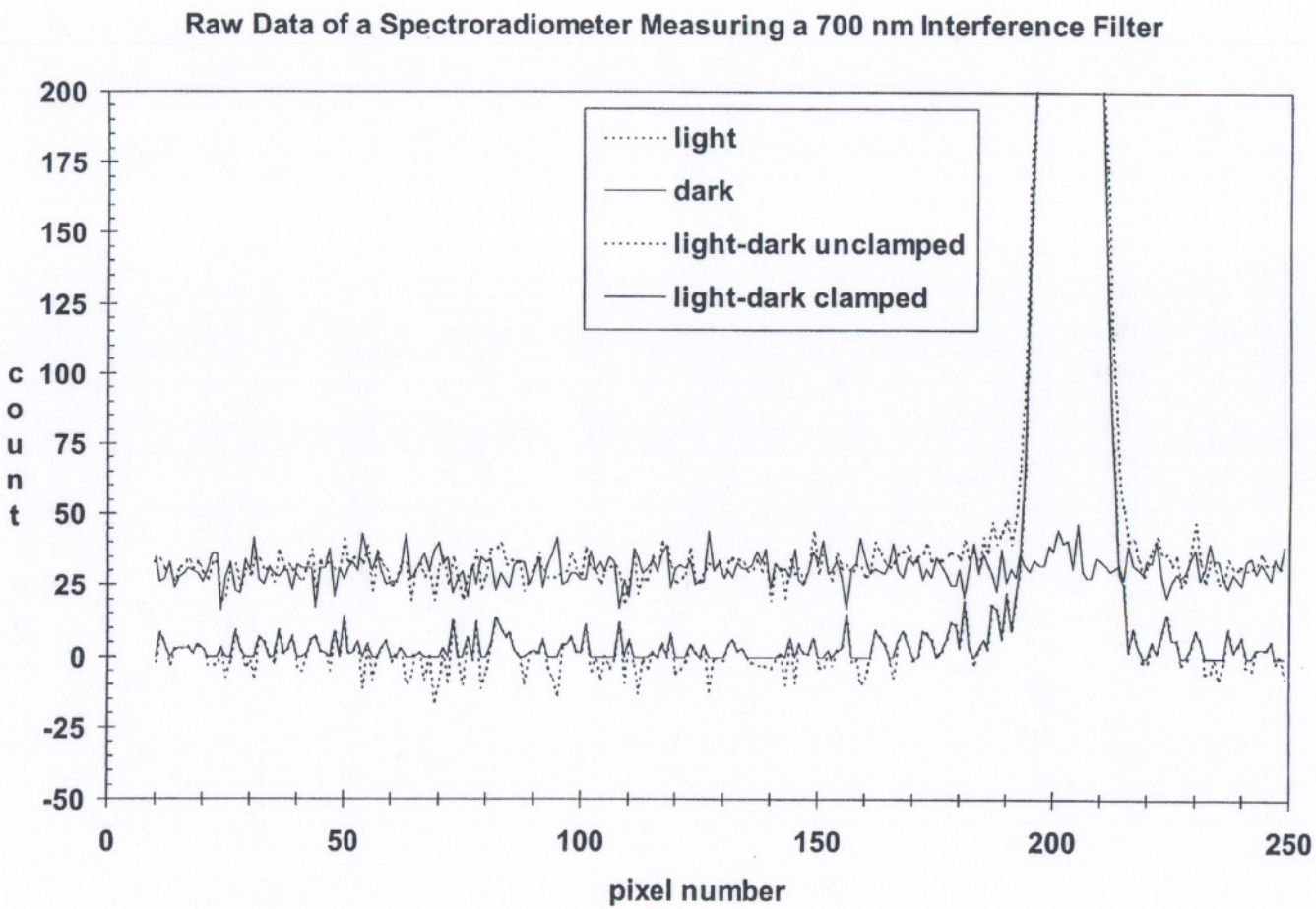
BACKGROUND NOISE AND SCATTERING



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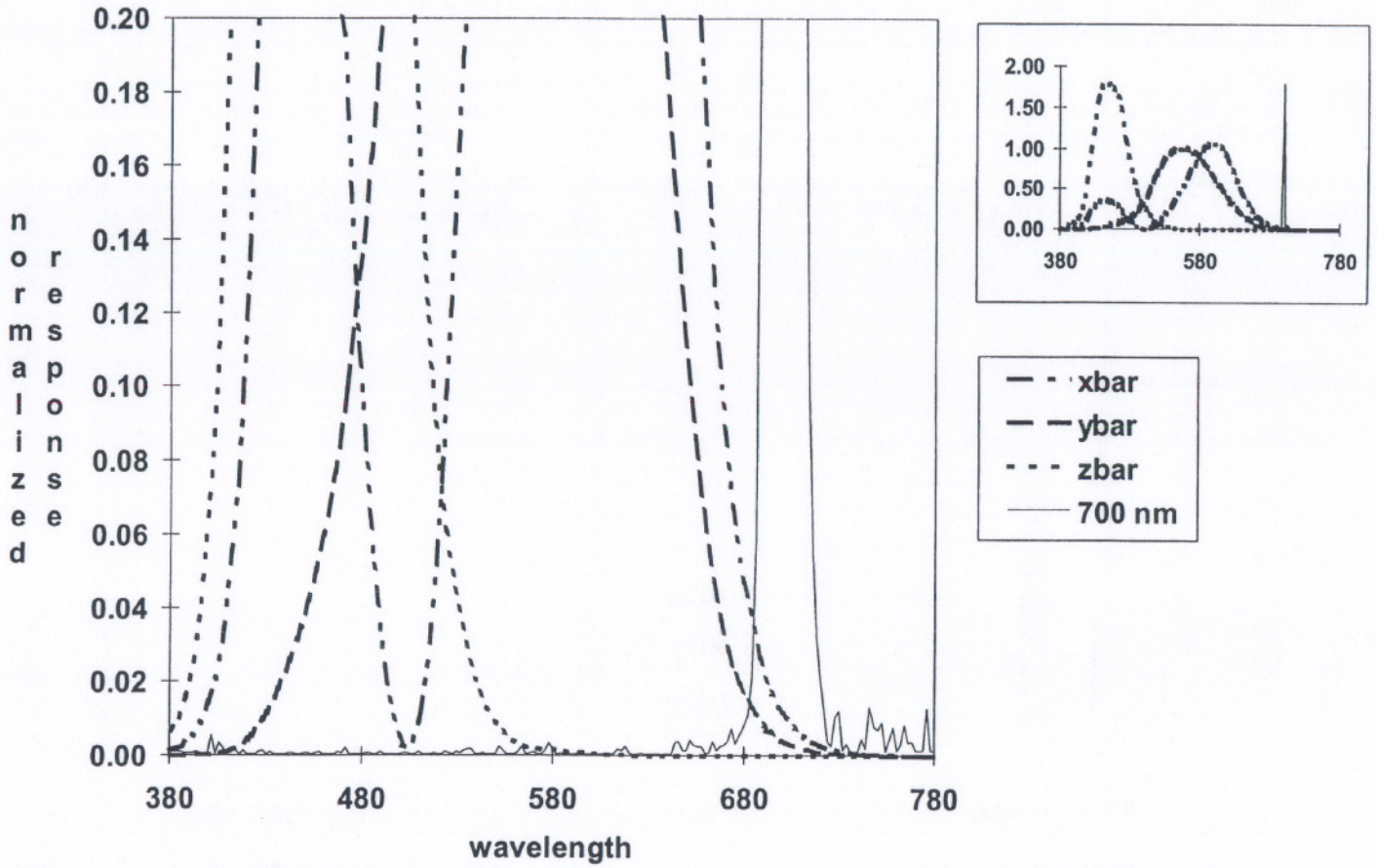
INWARD CURVING AT THE EXTREME VALUES

Effect of Noise on Tristimulus Response Contribution



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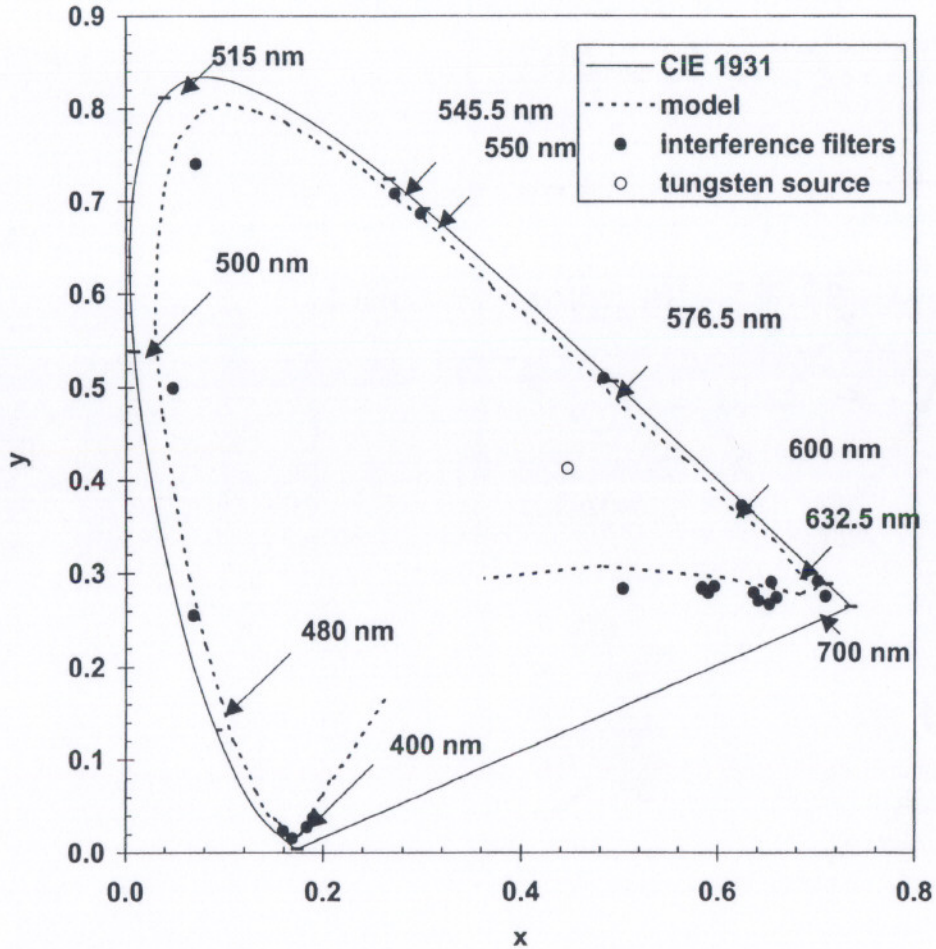
ERROR MODEL

Measured Data versus Model



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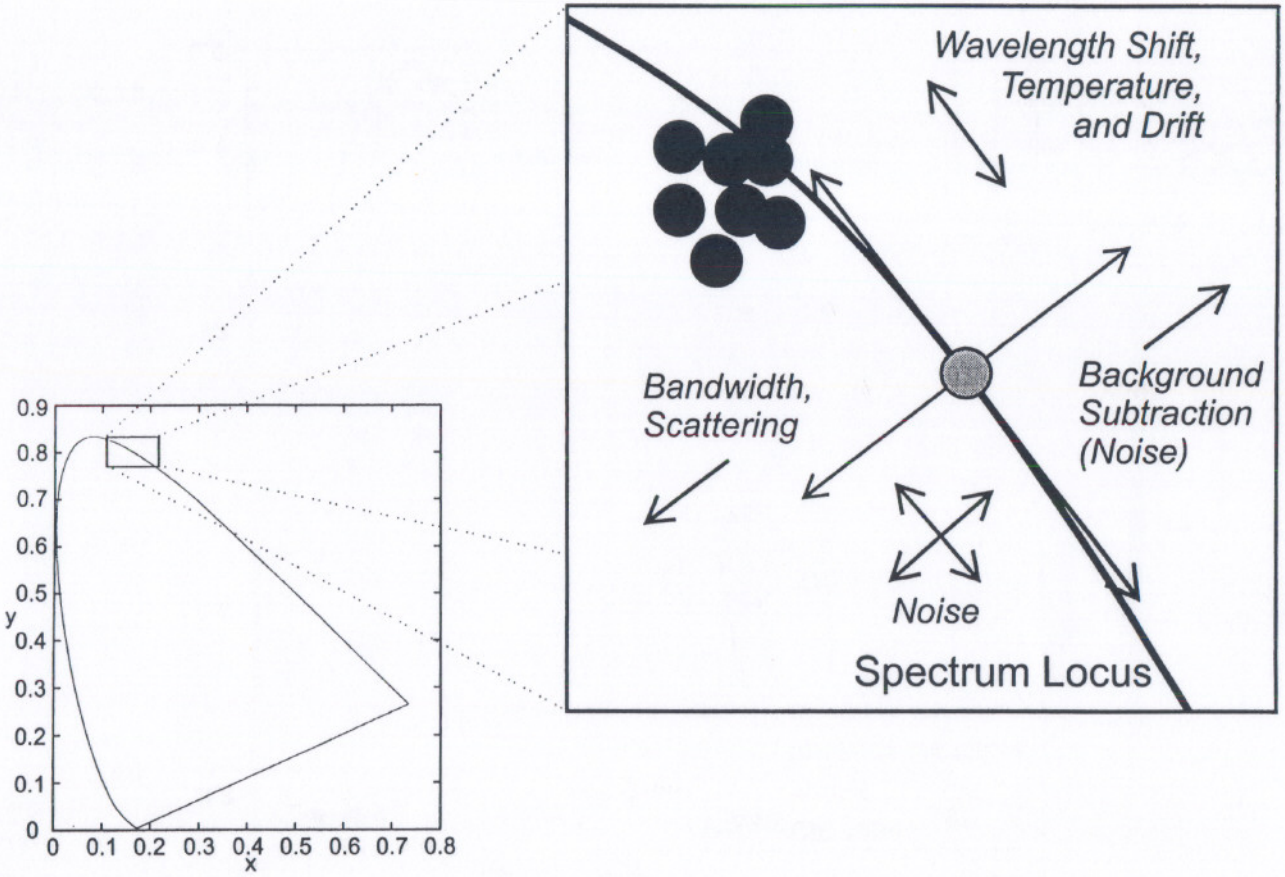
SOURCES OF ERROR



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