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Subject: Performance Calculation   From: J. S. Thompson

This describes the problem I outlined to you in a little more detail.

1. From Toller-Gray program obtain

$$T_s(\Sigma, \nu) \ \& \ T_T(\Sigma, \nu) \text{ for } 0 \leq \nu \leq 200 \, \ell/m.m.$$

and $-15° \leq \Sigma \leq +30°$; $5°$.

on cards.

2. Make a least squares fit of a polynomial to these, such that $|T_{TG} - T_{LS}| \leq 0.005$

3. Using George Judd's program:

For an assigned Σ & Ω compute

$$\Delta x(x, y, \Sigma, \Omega) = x_s + \frac{2}{\pi} a$$

and $$\Delta y(x, y, \Sigma, \Omega) = y_s + \frac{2}{\pi} a$$

4. Compute $$T_{xM}(R, \nu) = \frac{\sin\{25.4\pi\nu[x_s(x,y) + \frac{2}{\pi}a]\}}{25.4\pi\nu[x_s(x,y) + \frac{2}{\pi}a]}$$

and $$T_{yM}(R, \nu) = \frac{\sin\{25.4\pi\nu[y_s(x,y) + \frac{2}{\pi}a]\}}{25.4\pi\nu[y_s(x,y) + \frac{2}{\pi}a]}$$

where $x = R\cos\vartheta$

and $y = R\sin\vartheta$

5. For Σ & Ω fixed average the eight values of T_{xM} obtained by assigning values to ϑ : $0 \leq \theta \leq 315$: $45°$. This will give $\overline{T}_{xM}(\Sigma, \Omega, R, \nu)$

Do the same to obtain $\overline{T}_{yM}(\Sigma, \Omega, R, \nu)$

6. Compute

$$\overline{T}_x = \sqrt{T_s(\Sigma, \nu) \, \overline{T}_{xM}(\Sigma, \Omega, R, \nu)}$$

$$\overline{T}_y = \sqrt{T_T(\Omega, \nu) \, \overline{T}_{yM}(\Sigma, \Omega, R, \nu)}$$

7. Average $\overline{\overline{T}}_x(\Sigma, \Omega, R, \nu)$ over all Σ and Ω for $0 \leq \Omega \leq 40°; 10°$. This will give $\overline{\overline{\overline{T}}}_x(R, \nu)$

   Do the same to obtain $\overline{\overline{\overline{T}}}_y(R, \nu)$

8. Form $\overline{\overline{\overline{T}}}(R, \nu) = \sqrt{\overline{\overline{\overline{T}}}_x(R, \nu) * \overline{\overline{\overline{T}}}_y(R, \nu)}$

9. Solve simultaneously with AIM (ν) to obtain $P_i(R)$

10. Assign a = 50×10^{-6} to give $P_1(R)$

    Assign a = 125×10^{-6} to give $P_2(R)$

11. Compute $R^*(R) = \frac{P_2(R)}{P_1(R)}$

Do 3 through 11 for $0 \leq R \leq 5; 0.5$ and plot. $R^*(R)$ versus R.

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