

TRIPATHY, S.P. & BARLOW, H.B. (1996). The effect of dot number correspondence noise in random dot kinematograms. *Investigative Ophthalmology and Visual Science (Suppl.)*, 37/3, pp.S745.

3409 — B195

THE EFFECT OF DOT NUMBER ON CORRESPONDENCE NOISE IN RANDOM DOT KINEMATOGAMS ((S P Tripathy and H B Barlow))
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Purpose To test whether correspondence noise is the factor limiting detection of coherent motion in two-frame random dot kinematograms we varied the number of dots (N_1 and N_2) in each frame, calculated the expected change in correspondence noise, and measured the effect on coherence threshold. **Methods** Fixed proportions of the first frame dots were moved coherently either to the left or to the right. The observer had to judge whether motion was leftward or rightward, and the results were treated by probit analysis. The coherence threshold is the proportion yielding $D' = 1$ for distinguishing direction of motion. **Results** Over a large range of testable dot numbers the coherence threshold changed with $\sqrt{N_2/N_1}$ as expected from the calculated correspondence noise, and was little affected by the total number of dots, also as expected. The threshold was higher than predicted when N_2 was four times N_1 ; we attribute this to the unequal brightness of the two frames, and the discrepancy was reduced when the second-frame dots were made dimmer. All coherence thresholds were, however, much higher than those calculated for an ideal detector of coherent motion, so there is another important factor degrading performance which we believe to be the limited precision of the motion system in using the accurately positioned dots of the kinematograms. **Conclusions** These results fit in with others and confirm the importance of correspondence noise as a factor limiting coherence threshold in random dot kinematograms.