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MODULATION OF CLASSICAL RECEPTIVE FIELD RESPONSES BY MOVING TEXTURE BACKGROUNDS IN MONKEY STRIATE CORTEX: SPATIAL AND TEMPORAL INTERACTIONS. J.M. Fox, T. Delbruck*, J.L. Gallant, C.H. Anderson*, and D.C. Van Essen. Div. of Biology 216-76, Caltech, Pasadena, CA 91125.

We have examined the effect of texture patterns moving outside the classical receptive field (CRF) on the spatial sensitivity profile of single units in striate cortex (V1) of anesthetized macaque monkeys. Our stimuli consisted of a target and a moving background. The target was an optimally oriented line segment flashed at different locations along an axis orthogonal to the preferred orientation within the CRF, and in different phases relative to the background motion. The background was a random dot pattern lying entirely outside the CRF and oscillating at a temporal frequency of 2Hz along this axis. Responses were compared for 3 to 5 positions of the flashed target, and across 4 phases of the background motion. We also examined responses to targets flashed in the absence of a background, and to moving backgrounds alone.

In the 35 cells subjected to detailed analysis thus far, we found that approximately half (17/35) showed a significant modulation of the responses to the target by the moving background. The background caused enhanced responses to the target in some instances and suppression in others; the magnitude of the effect was two-fold or more in some cells. In the majority of cells the background produced enhancement or suppression only within a subset of the spatial locations and phase conditions tested. In a minority of cells there was a differential effect, such that targets presented at a particular phase were enhanced at one target location and suppressed at another. These observations suggest that complex spatio-temporal interactions between target and background occur in V1.