

# **FAST OSCILLATIONS AND TWO DIMENSIONAL COINCIDENCE DETECTION IN SOMATOSENSORY CORTEX**

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Coincidence detection in visual and auditory cortex may also be critical for feature analysis in somatosensory cortex. We have examined its role in the rat postero-medial barrel subfield (PMBSF) using high-resolution arrays of epipial electrodes. Five vibrissae, forming an arc, row, or diagonal, were simultaneously or asynchronously stimulated to simulate contact with a straight edge of different angles at natural whisking velocities. Our results indicate super-linear responses for both slow wave and fast oscillations (FO;  $\sim 350$  Hz) at inter-vibrissa delays  $< 2$ ms. FO represent the earliest and most precisely tuned response to coincident vibrissa displacement. There is little difference in the spatiotemporal pattern of slow wave or FO responses in the row, arc, or diagonal. This equivalence of function suggests that the PMBSF may be capable of working as a two dimensional integrative array, processing spatial features based on coincidence detection despite the direction that the vibrissae pass across an object.