A laminar model of the layers 4 and 2/3 of area V1 is presented. The model addresses development as well as functional roles of the horizontal connections found in these two cortical layers. It is assumed that V1 is subject to visual experience at the eye opening, through poorly tuned LGN input. It is further assumed that LGN input targets layer 4 solely, whereas layer 2/3 receives sensory input from layer 4. These assumptions are sufficient for modeling how correlation based networks of horizontal connections are developed simultaneously in layers 4 and 2/3. These assumptions are in line with reports on rapid improvement of OS during the first weeks after eye opening, when the eyes are subject to normal visual experience.

The laminar network resembles some of the cortical layers' properties. In layer 4 local connections target mainly the local iso-orientation domain, whereas **isotropic** long-range connections are distributed equally between orientation domains. In contrast, the layer 2/3 projections are modularly as well as axially specific along the orientation axis of the units. Modular specificity is explained by the finding that units in this layer are rarely anticorrelated. Patches are located at the iso-orientation domains. This indicates strong correlated activity between units that are selective for similar orientations, **no anti correlation, only non correlation**. Due to axial specificity of the long-range connections this networks functions as an elongated summation pools.

Orientation selectivity (OS) is prominent in both layers. In addition layer 2/3 demonstrates configuration-specific facilitation phenomena. Simulation results suggest that the visibility of a stimulus is improved due to its elongation along one direction. The degree of facilitation is related to the direction of elongation, since summation pools found in the layer 2/3 network are axially specific along the orientation axis of the units. Observe that anisotropic inputs from this network are sufficient for explaining configuration-specific facilitation phenomena. It seems also that differences in facilitation effects are more prominent in low-contrast conditions. Note further that the layer 4 network receives input from a circular region, and hence does not take part in this process.