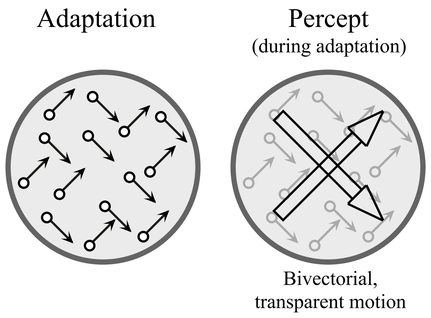
Vidnyanszky, Z., Blaser, E., & Papathomas, T. (2001). An explanation for unidirectional motion aftereffects following adaptation to bivectorial transparent motion. The Annual Meeting of the Vision Sciences Society, Sarasota, FL

Question

Why does adaptation to bivectorial transparent motion give rise to a unidirectional motion aftereffect (MAE)?



Hypothesis

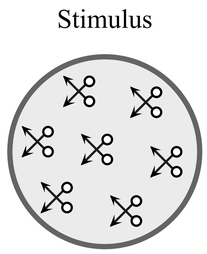
MAE is unidirectional after adaptation to transparent bivectorial motion for the same reason that bivectorial locally paired motion displays (LPD) do not appear transparent; i.e. failure of segmentation mechanisms that would lead to the formation of two transparent moving surfaces.

During adaptation to transparent motion, adaptation for both directions occurs at all locations.

Therefore, during subsequent testing for MAE, at each dot/location motion signals arise simultaneously in two directions (opposite to the adapted directions).

Therefore, after adaptation to bivectorial transparent motion the motion system faces the same challenge as when viewing bivectorial motion displays where the dots with different directions are locally paired (LPD).

Locally Paired Motion

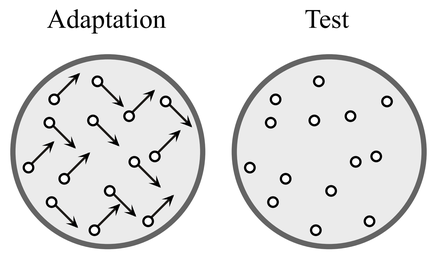


Properties of LPD motion displays:

Opposite directions do not segment into two separate surfaces and do not give rise to transparency, but instead appear as directionless flicker.

Orthogonally moving LPD motion is perceived in the in the vector average direction of the two components

Motion adaptation

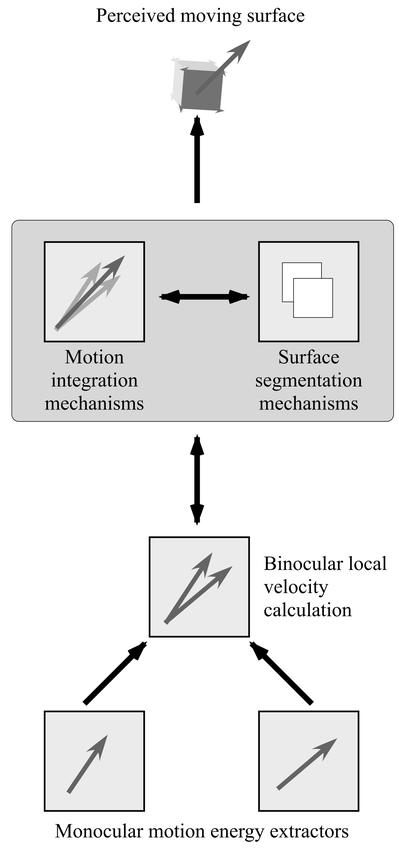


Cues that lead to motion transparency

LPD:
- **yes:** disparity, spatial frequency
- **no:** color, ocularity

MAE:
- **yes:** disparity, speed
- **no:** color, ocularity

Model



Conclusions

Models aiming at explaining motion transparency both in real motion and motion aftereffect must incorporate mechanisms of surface segmentation.