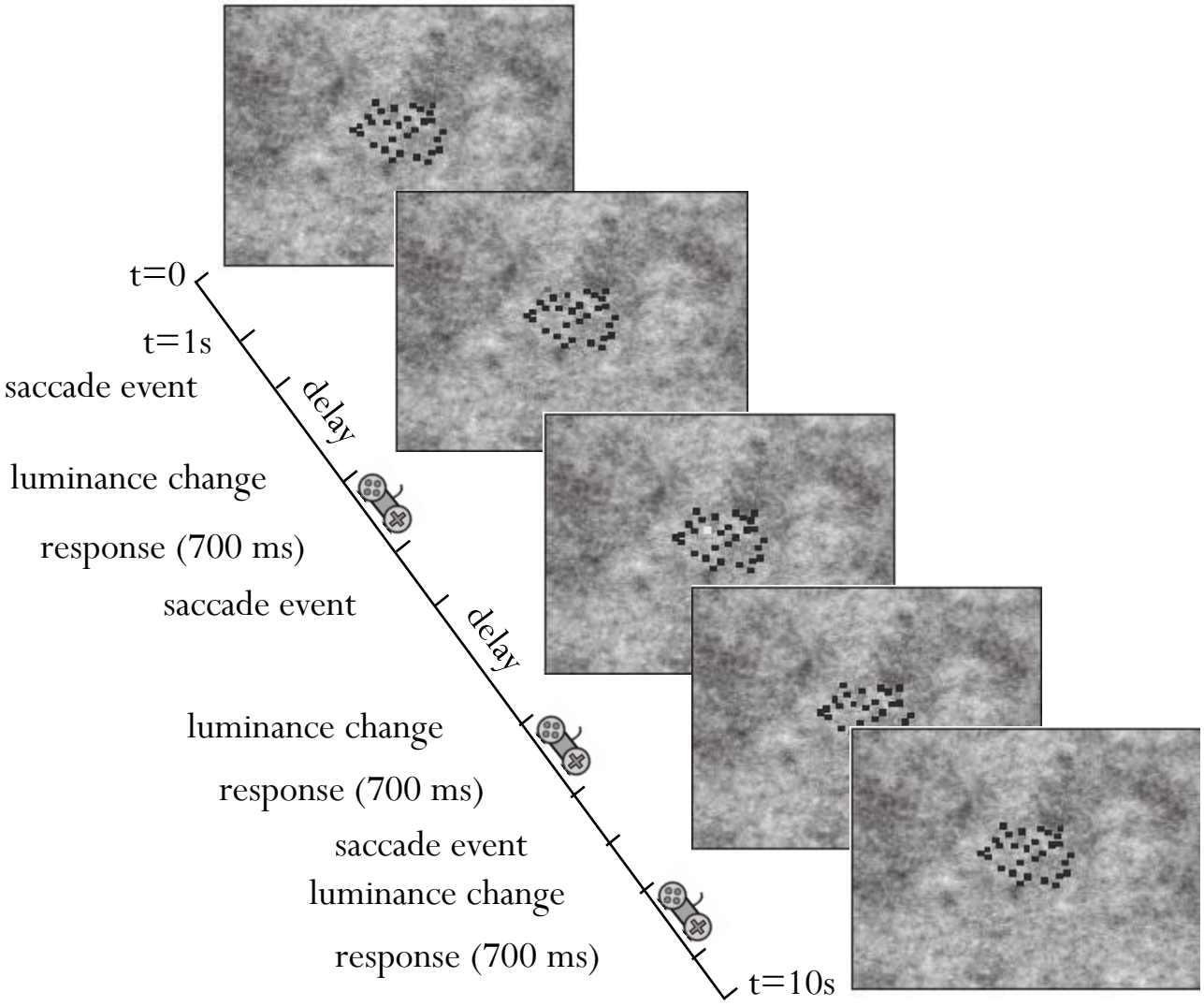
Peri-microsaccadic vision

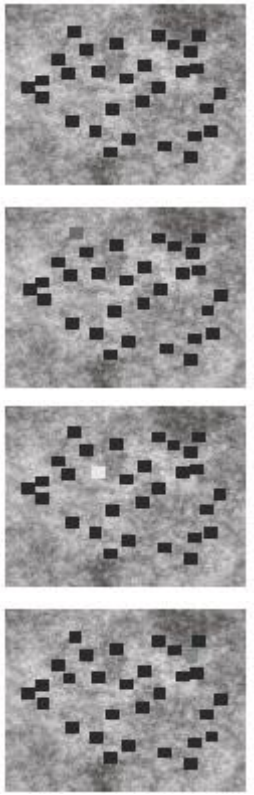
2-6-15

Study objectives:

- Examine the Spatiotemporal profile of peri-microsaccadic detection thresholds.
- Examine the homogeneity of visual thresholds across the retina.
- Study the dynamics of saccadic suppression phenomena across the retina.

Experimental design

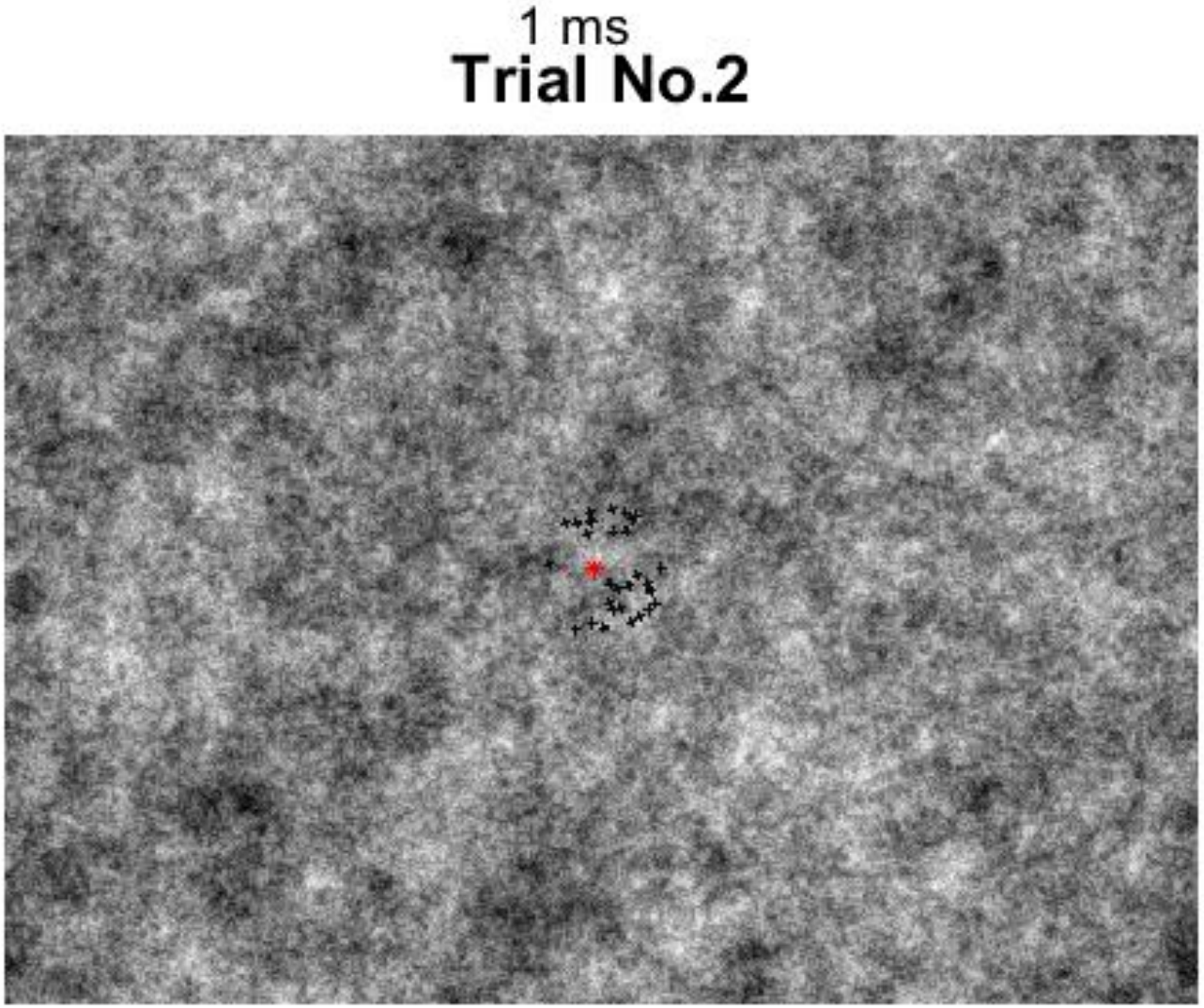




Experiment paradigm

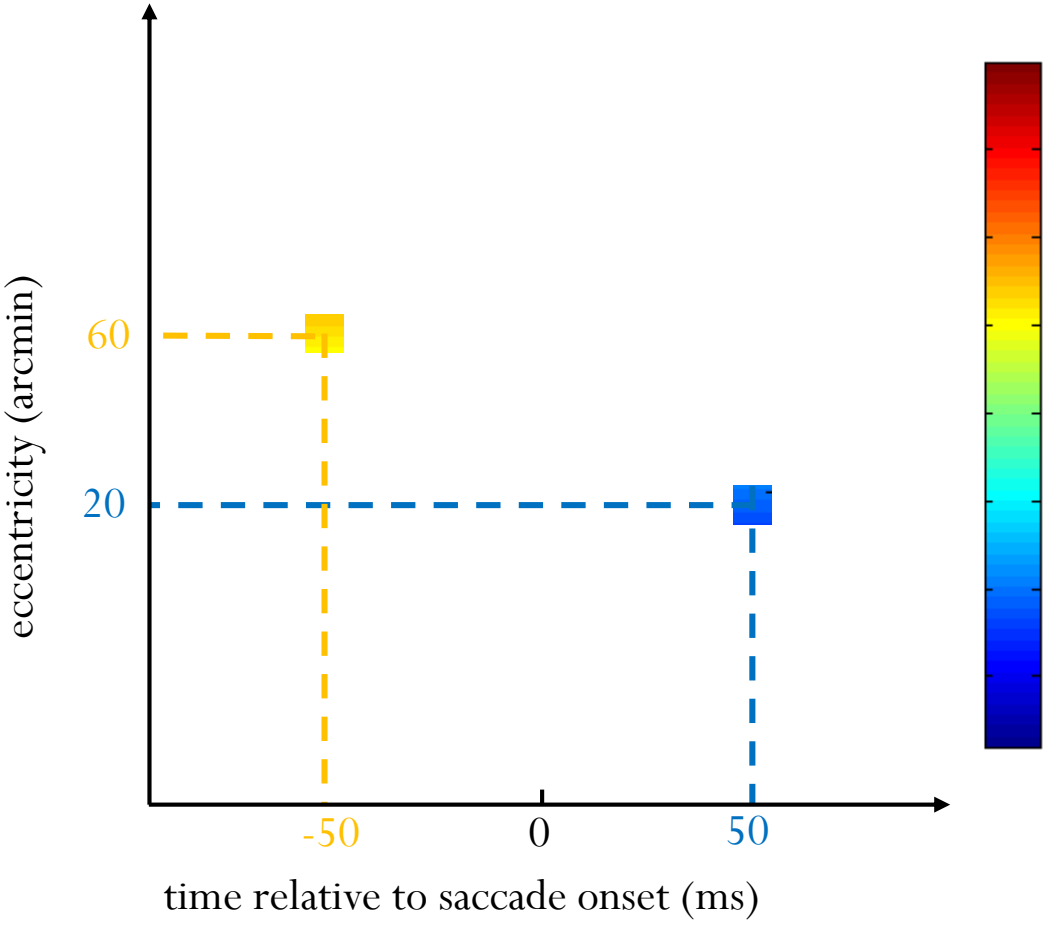
- Each session consists of 4 blocks of 50 trials.
- 50 background images are produced and saved for each block. All subjects are exposed to the same backgrounds but in randomized order.
- Objects (squares) are uniformly distributed within 1 deg radius from the center of the screen.
- Trial starts when the eye enters a 2 deg window around the center.
- Upon occurrence of a microsaccade or small saccade (< 1 deg), a luminance change occurs after a delay.
- The delay varies between: 5, 20, 70, 100, 150, 250 and 400 ms.
- The duration of change is 50 ms.
- Observers have 700 ms to respond after each change.
- 8 contrast change levels are tested: 25, 30, 35, 45, 50, 55, 60, 65.
- Upon detection of the change, observers have to press the X button as soon as possible.
- The minimum distance between each 2 objects is 5 arcmin.
- There is a calibration trial after each trial.

An example trial

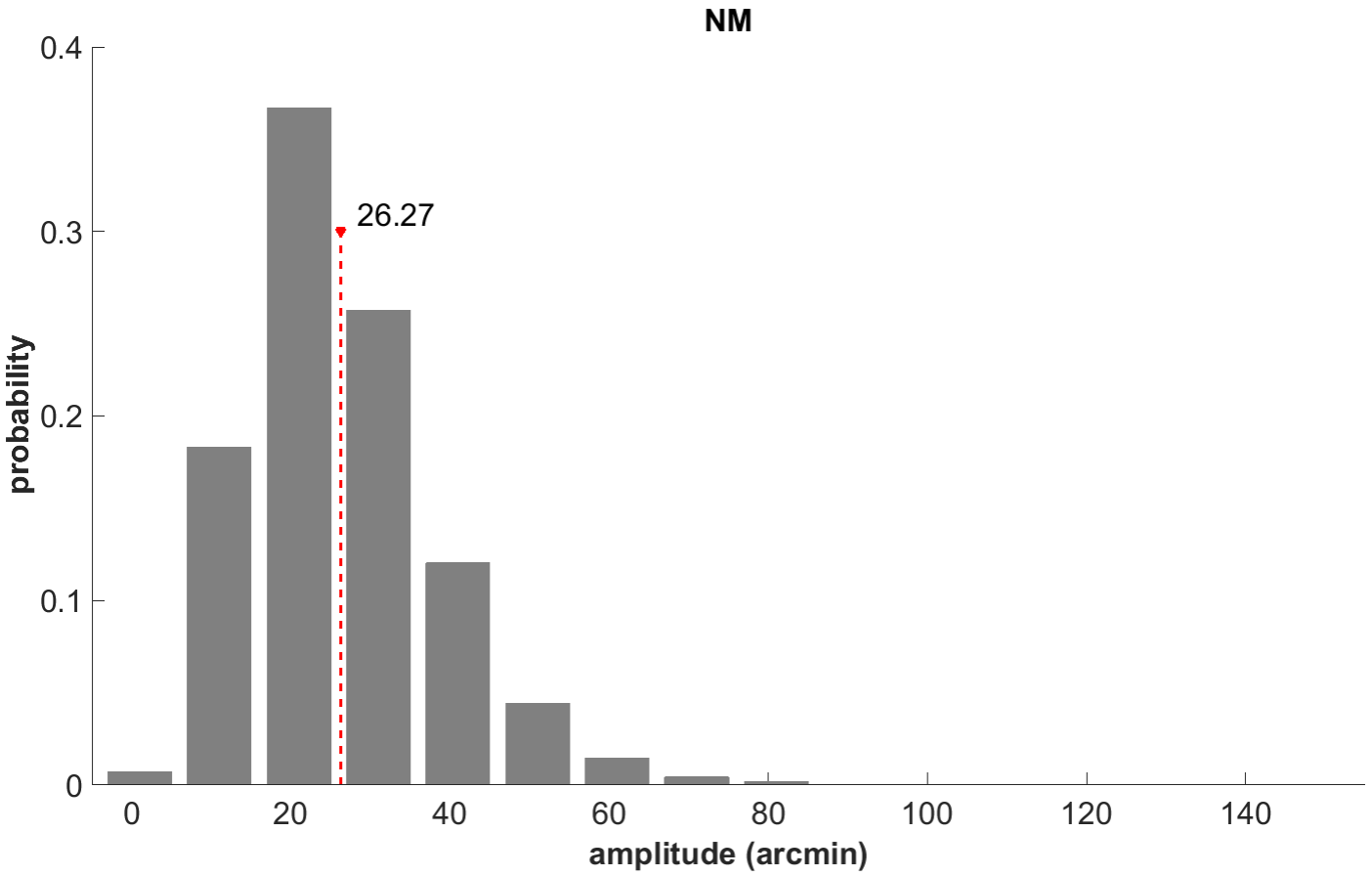


Study objectives:

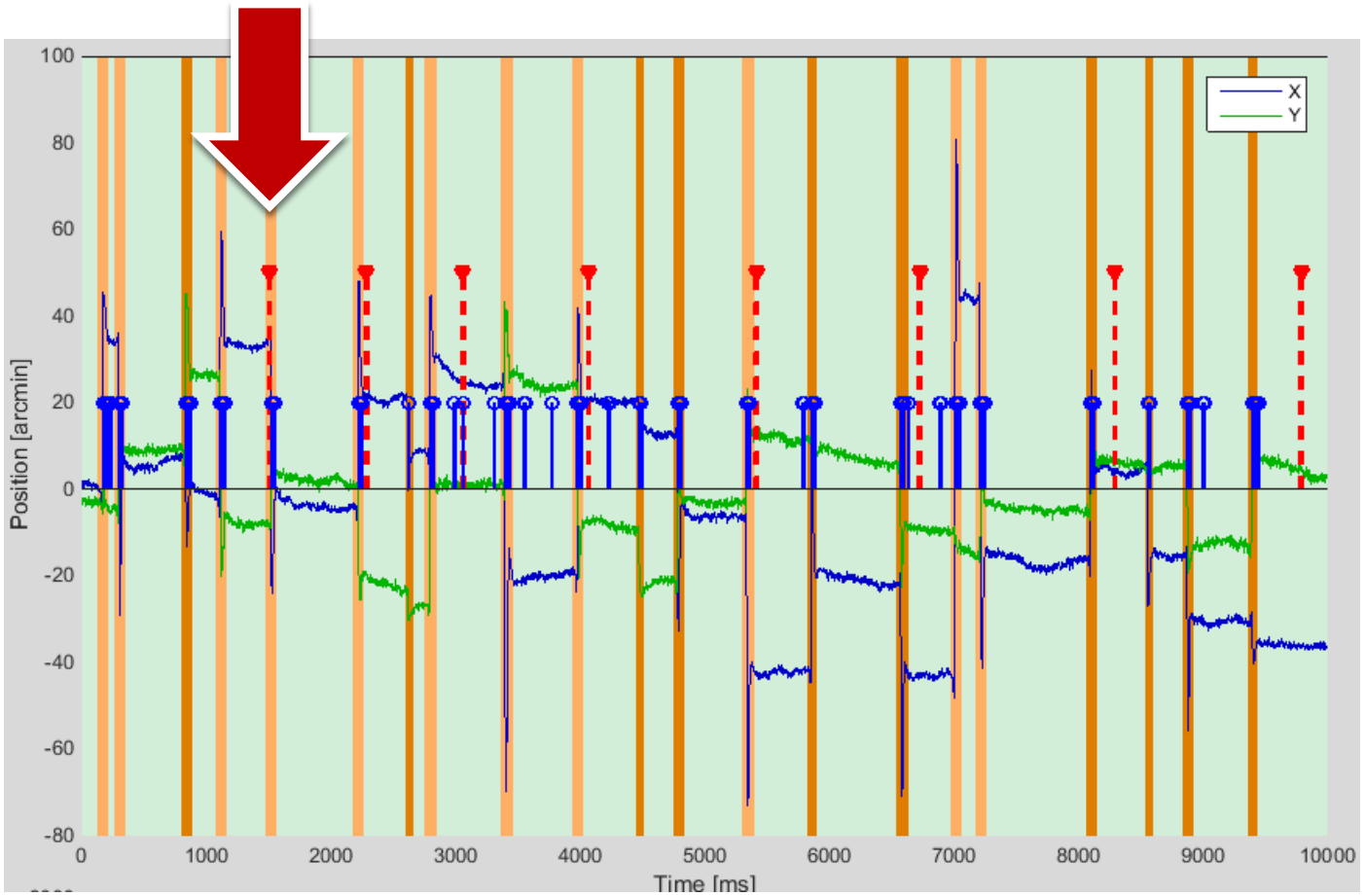
Construct the 3D map of visibility relative to saccade onset



Distribution of saccade amplitudes



An example trial



At t=1073 ms we have a saccade of 48.33 arcmin (3rd saccade). The trigger becomes 1 at 1103 ms. The delay of 400 ms is initiated at this point and the change in luminance occurs at t=1505.7 ms.

Measuring contrast sensitivity

- Time window
- Spatial window

Measuring contrast sensitivity

- Time window: 0-25 ms from the onset of a saccade (no proceding saccade in the next 150 ms).
- Spatial window: 0-30 arcmin