Figures in this folder:

A close look at the variation of vergence velocity during saccades. We show vergence velocity during saccades with convergence and divergence for each monkey, as well as the saccades without vergence.

The purpose of this is to piece together the difference between vergence transients and vergence enhancement.

First, let’s look at the saccades with convergence. Both monkeys show a rapid vergence enhancement during these saccades. The peak converging velocities are similar between the two monkeys, but most converging saccades in Bee show an initial divergence that is not seen in Ozette. Given that the visual targets require convergence, these divergence movements must be transients.

Indeed, if we look at saccades between targets at the same depth, we see rapid divergence transients made by Bee, but nothing comparable in Ozette. This suggests two separate mechanisms influencing vergence velocity during saccades: enhancement and transients.

Going back to the converging saccades, we see diversity in the amount of the transient that is visible in Bee’s saccades. For saccades where the divergence transient is obscured, the vergence velocity begins building up prior to the initiation of the saccade, such as in the center lower panel. The other panels show a range of visibility of the divergence transient. However, when we compare these to Ozette, there is evidence of an effect of this divergence transient even when it isn’t visible as a distinct peak. In Ozette, vergence enhancement begins at the same time as saccade onset, while vergence enhancement in Bee seems to be delayed, even during saccades where there is no visible divergence transient. This suggests that the transients are affecting vergence movements during saccades, even in cases when there is no observable divergence. This means that separating the effect of the transients and enhancement is not as simple as ignoring or removing the divergence peak.

It is worth distinguishing effects of transients from enhancement because they may be a result of separate neural mechanisms.