Supplementary Figure 1. Signals and noise in excitatory synaptic input to neighboring On and Off RGCs is negatively correlated.

The cross correlation function between the total excitatory synaptic input evoked in neighboring On and Off RGCs by fluctuations in light intensity exhibits a strong negative peak (black line). The cross correlation function for residuals of the same excitatory postsynaptic conductances also exhibit a negative peak whether the residuals originated from conductances evoked by stimuli that did (50% contrast) or did not (0% contrast) vary about the mean intensity. Shuffling the trials had little effect on the correlation function for the total excitatory postsynaptic conductances (dashed black line - largely occluded by the solid black line) but abolished the peak of the cross correlation function for residuals of excitatory postsynaptic conductances evoked by 50% and 0% contrast stimuli (dashed blue/yellow line).

The residuals of excitatory synaptic input to On RGCs and inhibitory synaptic input to Off RGCs were equally (negatively) correlated in the presence and absence of stimulus contrast (Fig 3), indicating that noise in or upstream of the AII amacrine cell did not depend fluctuations in light intensity. The peak of the cross correlation function for residuals of excitatory synaptic input evoked by 50% and 0% contrast stimuli, on the other hand, was different. This result suggests that, in the presence of high contrast light stimuli, a source of noise downstream of the AII impacts excitatory synaptic input to Off RGCs, decreasing the degree to which excitatory synaptic input to neighboring On and Off RGCs is correlated.