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**Victor Barranca\*** (barrav@rpi.edu), 2187 12th Street, Troy, NY 12180. *Is our Sensing Compressed?*

Along the early stages of many sensory pathways, significant downstream reductions occur in the numbers of neurons transmitting stimuli. To understand how much information is lost due to such a reduction, we investigate an idealized mathematical model of the retina using an integrate-and-fire type modeling structure. Our model features a large network of receptor cells randomly and sparsely coupled to a relatively small network of downstream neurons. Using numerical simulations of our model dynamical system combined with a static mean-field analytical reduction, we demonstrate firing patterns in the downstream neurons can in fact be used to reconstruct stimuli. We study how the quality of the reconstruction depends on our choice physiological features reflected by the model parameters, and confirm mechanisms of data-preservation similar to compressive sensing may be at work in receptive fields. We expect our methods to provide guidance for studying information loss in more realistic neuronal network models as well as experiments studying stimuli reconstruction in sensory pathways. (Received September 14, 2012)