For refractive weak turbulence the log-variance, $\sigma_{\ln I}^2$, of the signal received by the detector of a large aperture scintillometer (LAS) is directly related to the structure parameter of refractive index $C_n^2$. In particular, in the weak turbulence regime $\sigma_{\ln I}^2$ is proportional to $C_n^2$ and to the path length $L$. However, when the actual $C_n^2$ exceeds a certain threshold value saturation of scintillation will occur and the simple LAS formula derived for weak turbulence will be violated resulting in errors in the measured $C_n^2$. In the literature different criteria for saturation can be found as well as different correction procedures. Recently, Kohsiek et al. (2006) applied data collected with a 30 cm XLAS over heterogamous agricultural landscape in Germany and over grass land and sparse built-up areas in the Netherlands to test several correction schemes. In the summer of 2007 we carried out the Sevilleta Scintillometer Saturation Field Experiment to test the different saturation correction procedures and criteria over more homogeneous dry natural grassland in New Mexico. Since, the path length $L$, and the aperture diameters of the LAS $D$ are relevant parameters in the saturation problem we used a number of LAS’s with different path lengths and apertures: Two $D = 0.15$ m Fresnel lens LASs of Kipp & Zonen at a height of 2.5 m and with a path length of $L = 544$ and 1050 m respectively, a $D = 0.30$ m aperture XLAS of Kipp & Zonen at 2.5 m and $L = 1049$ m, and a dual-transmitter multi LED LAS (Scintec) at 2.52 m and $L = 1047$ m. In the center of the scintillometer paths an eddy correlation system (CSAT of Campbell Sci.) was installed at 2.51 m, from which $C_n^2$ has been evaluated. Sensible heat fluxes up to 350 Wm$^{-2}$ were observed during the
experiment. The first results of Sevilleta Scintillometer Saturation Field Experiment will be presented.