1046-37-1983 **Andrew J.N. Parrish*** (`aparrish@memphis.edu`), 1055 Goodman St., Memphis, TN 38111.
Pointwise Convergence of Ergodic Averages in Orlicz Spaces.

We construct a sequence $\{a_n\}$ such that for any measure preserving system (X, Σ, m, T) the ergodic averages

$$A_N f(x) = \frac{1}{N} \sum_{n=1}^{N} f(T^{a_n} x)$$

converge a.e. for all f in $L \log \log(L)$, but fail to have a finite limit for some L^1 function. In fact, we show that one may construct sequences for which these averages converge a.e. for any Orlicz space strictly smaller than L^1, but fail to converge for some L^1 function. This ultimately extends the work of K. Reinhold. Reinhold, building on the work of A. Bellow, constructed a sequence for which the averages $A_N f(x)$ converge a.e. for L^p, $p > 1$, but do not converge for some f in L^1. Our method, introduced by Bellow and later extended by Reinhold and M. Wierdl, is perturbation. (Received September 17, 2008)