1026-11-47 **Igor E. Shparlinski*** (igor@ics.mq.edu.au), Department of Computing, Macquarie University, North Ryde, Sydney, NSW 2109, Australia. *Distribution of Modular Inverses and Multiples of Small Integers and the Sato–Tate Conjecture on Average.*

We show that, for sufficiently large integers m and X, for almost all $a = 1, \ldots, m$ the ratios a/x and the products ax, where $|x| \le X$, are very uniformly distributed in the residue ring modulo m. This extends some recent results of Garaev and Karatsuba. We apply this result to show that on average over r and s, ranging over relatively short intervals, the distribution of Kloosterman sums

$$K_{r,s}(p) = \sum_{n=1}^{p-1} \exp(2\pi i(rn + sn^{-1})/p),$$

for primes $p \le T$ is in accordance with the Sato–Tate conjecture. (Received January 29, 2007)