1070-37-194 **Eric Bedford** and **Kyounghee Kim*** (kim@math.fsu.edu), Department of Mathematics, FSU, Tallahassee, FL 32306. *Linear Fractional Recurrences: Periodicities and Integrability.*

We consider k-step recurrences of the form $z_{n+k} = A(z)/B(z)$, where A and B are linear functions of $z_n, z_{n+1}, ..., z_{n+k-1}$, which we call k-step linear fractional recurrences. The first Theorem in this paper shows that for each k there are k-step linear fractional recurrences which are periodic of period 4k. Among this class of recurrences, there is also the so-called Lyness process, which has the form $A(z)/B(z) = (a + z_{n+1} + z_{n+2} + ... + z_{n+k-1})/z_n$. The second Theorem shows that the Lyness process has quadratic degree growth. The Lyness process is integrable, and we discuss its known integrals. (Received February 11, 2011)