1145-VM-2748 **Terrence Adams*** (`terry@ganita.org`) and **Joseph Rosenblatt**. *Existence of Coboundaries.*
We consider the fundamental coboundary equation: $f = g - g \circ T$. Suppose $(X, \mathcal{B}, \mu)$ is a separable probability space. We show that given $f \in L_p$, $p \geq 1$, there exists $g \in L_{p-1}$ and an ergodic measure preserving invertible transformation T on $(X, \mathcal{B}, \mu)$ such that $f(x) = g(x) - g(T(x))$ for almost every $x \in X$. On the other hand, we disprove a conjecture of Isaac Kornfeld by showing that it is not always possible to choose a transfer function $g \in L_p$. In particular, we show for every $p \geq 1$, there exists $f \in L_p$ such that for any ergodic measure preserving invertible T on $(X, \mathcal{B}, \mu)$ that satisfies the equation $f = g - g \circ T$, then $g \notin L_q$ for $q > p - 1$. We also consider moving averages and its connections with coboundaries. (Received September 25, 2018)