1068-42-73 **Fedor Nazarov**, Dept of Mathematics, University of Wisconsin, Madison, WI 53706, and **James Michael Wilson*** (wilson@cems.uvm.edu), 16 Colchester Avenue, Burlington, VT 05405. *The Buckley and the standard dyadic square functions.*

We discuss the relations between two natural forms of the dyadic square function on $\mathbf{R}^d$, denoted $S(f)$ ("standard") and $S_b(f)$ ("Buckley"). They are often confounded, but are only equal if $d = 1$. $S(f)$ dominates $S_b(f)$ but, if $d > 1$, $S_b(f)$ can be in L^∞ while $S(f) \equiv \infty$. Nevertheless, having $S_b(f) \in L^\infty$ implies that $S(f)$ is, in some sense, in the local exponential L^2 class. It is well-known that if $S(f) \in L^\infty$ then f is in the local exponential L^2 class, and this cannot be improved. We show that $S_b(f) \in L^\infty$ also implies that f is in the local exponential L^2 class. (Received January 12, 2011)