1086-05-894   **Samantha Pinella*** (`s.pinella@sms.ed.ac.uk`) and **Kristen Bartosz**. *Symmetric Difference Free Families.*

The symmetric difference of two subsets of [n] contains all elements that are in exactly one of the subsets. We treat the symmetric difference as a binary operator and explore its properties, including the number of ways a subset of [n] can be represented as the symmetric difference of other subsets of [n]. We use these properties to study symmetric difference free families. These are families of subsets that are Sidon; the symmetric difference of any two elements is not the same as the symmetric difference of another two elements. We present a greedy algorithm based lower bound and a pigeon-hole principle based upper bound on the size of families with this property. Finally, a model where we select subsets to be included in a family at a certain probability is utilized to see what probability is required for the Sidon property to hold, including what happens at the threshold. (Received September 15, 2012)