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Kenneth W Johnson* (kwj1@psu.edu), Penn State Abington, 1600 Woodland Road, Abington, PA 18901. *Fission of S-rings and association schemes*. Preliminary report.

For a finite group G the class algebra is a basic object, and if a random walk on G is associated to a probability $p : G \rightarrow [0, 1]$ the analysis of the walk is easier if p is constant on conjugacy classes. However, some recent work has shown that "fissions" of the class algebra may be produced which remain commutative. An upper bound for the size of such a fission is the degree of the total character of G . If a probability p is constant on the fissioned classes the associated random walk remains easier to handle. A general question in this direction is: Given any (commutative) association scheme, find a maximal fission of the scheme which remains commutative. I will discuss two cases.

(1) G acts on a set and contains a regular subgroup H . This gives rise to an S-ring over H . In the case where (G, H) is a Gelfand pair this S-ring is commutative.

For example G could be the symmetry group of a regular solid (random walk on an n -cube etc).

(2) Consider a loop Q and let G be its mapping group (the group generated by the left and right translations). The centralizer ring of the action of G on Q is necessarily commutative and may be regarded as an S-ring on H . It will be given of commutative fissions in the above cases. (Received August 10, 2015)