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Kenneth W Johnson* (kwj1@psu.edu), PA. *S-rings associated to random walks on groups and sets with group actions*. Preliminary report.

A random walk on a finite group G may be described as a probability on G . The analysis is more straightforward if p is constant on conjugacy classes. The class algebra is an example of an S-ring. Recent work with Humphries has shown that this S-ring splits into S-rings S' which remain commutative and if p is constant on the classes of such S' the corresponding random walk is also relatively easy to analyse. Now consider a random walk on a set X acted on by a transitive group G . Usually a p is given on G which is constant on the cosets of H , the stabiliser of a point. The "easy" case is when p is constant on the double cosets of H . In some cases, for example the random walk on a cube or icosahedron, there is a regular subgroup K of G , and there is naturally an S-ring S on K , which gives rise to an equivalent analysis of the walk. In the spirit of the previous paragraph, there is an associated algebraic problem: given an S-ring S on a group K , obtain the commutative S-rings which arise from splitting the classes of S . (Received August 14, 2016)