Bases of primitive diagonal groups
Joanna B. Fawcett (Cambridge)

A base $B$ of a finite permutation group $G$ acting on a set $\Omega$ is a subset of $\Omega$ with the property that only the identity can fix every point of $B$. Classically, bases have played an important role in the 150-year-old problem of bounding the order of a primitive permutation group in terms of its degree. Moreover, bases provide a more efficient way of storing actions of groups, and so they are used in various algorithms in computational group theory. In recent years, much work has been done on bounding the minimal size of a base of a primitive permutation group. After surveying some of the main results on this topic, we will look more closely at the base size of one of the five types of primitive permutation groups (as classified by the O’Nan–Scott Theorem), namely, the groups of diagonal type. In particular, we will see that these groups have a base of size 2 except in two cases and that in these cases, the minimal base size can be unbounded.