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Sara C. Billey*, University of Washington, Box 354350, Seattle, WA 98105, and **Matjaz Konvalinka** and **Frederick Matsen**. *Enumeration of Double Cosets in Symmetric Groups and Beyond*.

Let G be a group with subgroups H and K . The collection of double cosets $H \backslash G / K = \{HgK | g \in G\}$ partition G . The double cosets are generally more complicated than the one-sided cosets. For example, different double cosets can have different sizes. If G is finite, the size of $H \backslash G / K$ is given by the inner product on the character of the two trivial representations on H and K respectively induced up to G .

We will present recent results enumerating all distinct double cosets for certain types of subgroups of the symmetric groups. The first case was inspired by a problem in mathematical biology related to tanglegrams. This is joint work with Konvalinka and Matsen (see arXiv:1507.04976). The second case is inspired by the geometry/topology of generalized flag varieties related to parabolic subgroups. Some of our results extend to all Coxeter groups. This is joint work in progress with Konvalinka, Petersen, Slofstra and Tenner. (Received September 21, 2015)