

Two-block Springer fibers and Springer representations in types C & D

We explain how to construct an explicit topological model for every two-block Springer fiber of type C and D. These so-called topological Springer fibers are homeomorphic to their corresponding algebro-geometric Springer fiber. They are defined combinatorially using cup diagrams which appear in the context of finding closed formulas for parabolic Kazhdan-Lusztig polynomials of type D with respect to a maximal parabolic of type A. Cup diagrams are also crucial in defining so-called arc algebras which play an important role in extending Khovanov homology from links to tangles. As an application, it is discussed how the topological Springer fibers can be used to reconstruct the famous Springer representation in an elementary and combinatorial way.