On the number of cells in the source unfolding of convex 4-polytopes

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Abstract

Consider a fixed starting point s on the surface P of a convex 4-polytope, in the interior of some facet. The shortest paths from s to the other points of P can be grouped into equivalence classes according to the sequence of facets that they traverse. Equivalently, we can look at the sequence of 2-faces that are crossed. (A shortest path cannot pass through an edge of P unless it terminates there.)

It is unknown whether the number of equivalence classes is polynomial (like on the surface of a 3-polytope) or not.