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Some Geometric Properties of Limit Roots of Coxeter Groups

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Let W be an infinite Coxeter group, and consider the root system constructed from its geometric representation. In the past few years, together with Dyer, Hohlweg, Labbé, Préaux, we investigated the accumulation set of the directions of roots, which is a very pretty subset of the projective space, called the set of limit roots of W. Recently I have been working on some conjectures on the geometry of this limit set, and I will share some partial results. One of them involves a description of "parabolic slices" of limit roots (the intersection of the limit set with a vector subspace associated to a parabolic subgroup). I also explore the conjecture stating that the set of limit roots is equal to the intersection of its convex hull with the isotropic cone. As a byproduct of the computations involved in this quest, I obtain an interesting disjonction property about the set of dihedral limit roots.

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