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Divergence in Coxeter groups.

Divergence of a metric space is an interesting quasi-isometry invariant of the space which measures how geodesic rays diverge outside of a ball of radius r , as a function of r . Divergence of a finitely generated group is defined as the divergence of its Cayley graph. For symmetric spaces of non-compact type the divergence is either linear or exponential, and Gromov suggested that the same dichotomy should hold in a much larger class of non-positively curved CAT(0) spaces. However this turned out not to be the case and we now know that the spectrum of possible divergence functions on groups is very rich. In a joint project with Pallavi Dani, Yusra Naqvi, and Anne Thomas, we initiate the study of the divergence in the general Coxeter groups. We introduce a combinatorial invariant called the ‘hypergraph index’, which is computable from the Coxeter graph of the group, and use it to characterize when a Coxeter group has linear, quadratic or exponential divergence, and also when its divergence is bounded by a polynomial. (Received January 23, 2022)