
CRISTIAN RIOS, University of Calgary

Characterizations of the Keakeya maximal conjecture in three dimensions

We present two characterizations of the Keakeya maximal problem in three-dimensional space in terms of a trilinear formulation. The bilinear equivalence due to Tao, Vargas, and Vega dates to 1998, and previous trilinear formulations due to Bourgain and Guth [BG] fall short of characterizing the problem. We introduce a weaker condition on the separation of the domains for the multilinear components than the transversality condition required in [BG] which proves to be equivalent to the whole linear conjecture. The proof also provides single-scale wavelet projection estimates which are sufficient to establish the conjecture.