Algebro-Geometric Bootstrapping via OPE Decoupling

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We conjecture that decoupling relations in the operator product expansion of a 4d N=2 superconformal field theory (SCFT) are encoded by an algebro-geometric object: a bifiltered affine scheme. We demonstrate how this scheme reproduces the Macdonald index (thus the Schur index) as well as the Higgs branch. Although the associated scheme typically admits continuous deformations, we find that a geometric extremization principle uniquely fixes these moduli, thereby providing a possible geometric route toward a classification of 4d N=2 SCFTs.