

# Ideal enumeration for border apolarity

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The first step in lower bounding the border rank of a tensor or polynomial with border apolarity is to enumerate all ideals contained in the annihilator with Hilbert series equal to the Hilbert series of an ideal of general points. The second step requires determining whether any such ideal may be deformed to an ideal of points. Typically, one simplifies these questions by asking if there are any such ideals which are additionally fixed under a given solvable group of symmetries of the tensor or polynomial.

In this talk I discuss the challenges involved in the ideal enumeration step. At a high level, the ideals are enumerated multigraded component by component, but concrete questions arise. How should partially constructed ideals be represented? How are the symmetries of the tensor or polynomial handled? How do we proceed when the answer contains positive dimensional families? Furthermore, I anticipate the successful application of both steps of border apolarity will as much as possible interleave checks for deformability of partially built ideals into the early steps of enumeration. I hope this discussion will make clear the context in which tests for deformability will need to be applied.

**Orateur:** CONNER, Austin (Harvard University)