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Shelby P Cox* (shelbycox@umass.edu) and **Amal Mattoo** (amal.mattoo@gmail.com). *Euler characteristic of Hilbert schemes via colored Young diagrams.*

We are interested in finding a generating function for the Euler characteristic of the Hilbert scheme of points in the (singular) variety $\mathbb{C}^2/\mathbb{Z}_n$, and the Hilbert scheme of points in the (smooth) orbifold $[\mathbb{C}^2/\mathbb{Z}_n]$. For the former case, the problem reduces to finding a generating function for all 0-generated Young diagrams which contain a certain number of 0 colored squares i.e. those in correspondence with ideals generated by monomials trivially acted upon by the group action. We found a theorem which greatly simplifies the problem, and in some cases it reduces the problem into already solved cases.

For the orbifold case, the problem reduces to finding a generating function for all Young diagrams with a given coloring. We developed a procedure which results in the desired generating function, as well as closed form generating functions for some cases. We also explored the method of vertex operator algebras, which had previously been applied to prove MacMahon's formula counting plane partitions.

[Mentor: Amin Gholampour, University of Maryland College Park] (Received August 11, 2016)