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Algebraic Cycles, Chow Varieties, and Symmetric Polynomials. Preliminary report.

We want to understand spaces that parameterize projective subvarieties. One way to do this is to look at Algebraic Cycles. An Algebraic Cycle is a formal sum

$$\sum c_i X^i,$$

where $X^i \subset \mathbb{P}^{n-1}$ is an irreducible closed subvariety. If we take a family of irreducible subvarieties, its limit may have several irreducible components, i.e. the limit may be a general cycle.

We want to study this phenomenon and the Chow Varieties are a way of doing this. Simply put, the points of a Chow variety are Algebraic Cycles. We will explain at the Chow - Van der Waerden Theorem that imbeds the variety into projective space.

Finally we move on to a specific example, 0-cycles. We can use symmetric polynomials to work with 0-cycles. Using this we will look at the tangent space, and derive a formula for the tangent space of a multiple of smooth point. (Received September 25, 2012)