

The Borel fixed point method for the determination of singularities of the invariant Hilbert scheme

Let G be a reductive algebraic group over an algebraically closed field k acting on an affine scheme W . Then we can construct the so-called invariant Hilbert scheme \mathcal{H} which parametrizes the G -invariant closed subschemes Z of W in such a way that the coordinate ring $k[Z]$ of Z can be written as the direct sum of simple G -modules. We will take a look at how the invariant Hilbert scheme is constructed and at how to search for its singularities with the Borel fixed point method.