

Algebraic simplification of parametrizations

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Abstract.

We want to solve the following simplification problem. Assume that we are given a rational parametrization $\Phi(t_1, \dots, t_s) \in K[\alpha](t_1, \dots, t_s)^n$ of a variety V and that α is algebraic over a field K . Compute, if possible, another parametrization $\Psi \in K(t_1, \dots, t_s)^n$ of the variety V with coefficients in K . An example of such a problem is deciding if a surface given by a complex parametrization can be parametrized over the reals and computing such a parametrization.

We will show how the problem can be reduced to a special family of varieties called hypercircles and ultraquadrics, focusing on the case that V is a curve or a ruled or revolution complex surface.

References

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