

## ABSTRACT

# A GEOMETRIC APPROACH TO ABSOLUTE IRREDUCIBILITY OF POLYNOMIALS

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This thesis is a contribution to determine the absolute irreducibility of polynomials via their Newton polytopes.

For any field  $F$ , a polynomial  $f \in F[x_1, x_2, \dots, x_k]$  can be associated with a polytope, called its Newton polytope. If the polynomial  $f$  has integrally indecomposable Newton polytope, in the sense of Minkowski sum, then it is absolutely irreducible over  $F$ , i.e. irreducible over every algebraic extension of  $F$ . We present some new results giving integrally indecomposable classes of polytopes. Consequently, we have some new criteria giving infinitely many types of absolutely irreducible polynomials over arbitrary fields.

**Keywords:** Polynomials, absolute irreducibility, polytopes, integral indecomposability.