

## Abstract

A famous conjecture of Hayman says that if  $f(z)$  is a transcendental meromorphic function, then  $f'(z)f(z)^n$  assumes all finite values except possibly zero infinitely often. The conjecture was solved in most cases. Another result of Hayman says that  $f'(z) - af(z)^n$ , where  $n \geq 5$  and  $a$  is a complex number, assumes all finite values infinitely often. In this thesis, we will study the value distribution of some differential polynomial in a meromorphic function with small functions as coefficients. In fact, we will generalize Hayman's results to the cases  $f^{(k)}(z)f(z)^n$  and  $f^{(k)}(z) - af(z)^n$ . Also, the value distribution of meromorphic functions of class  $\mathcal{A}$  with their derivatives are obtained.

