

**Chen, Huaihui; Gu, Yongxing**

**Improvement of Marty's criterion and its application.** (English) Zbl 0777.30018  
Sci. China, Ser. A 36, No. 6, 674-681 (1993).

The classical spherical type criterion of F. Marty states that a family  $\mathcal{F}$  of functions meromorphic in a domain  $D$  is a normal family iff a spherical estimate  $|f'(z)| \leq c_K(1 + |f(z)|^2)$  holds uniformly for  $f \in \mathcal{F}$  and points  $z$  in any compact subset  $K \subset D$ . A Euclidean type criterion of an entirely different nature is originally due to *A. J. Lohwater* and *C. Pommerenke* [Ann. Acad. Sci. Fenn., Ser. A I 550, 12 p. (1973; Zbl 0275.30027)] with a later treatment given by *L. Zalcman* [Am. Math. Mon. 82, 813-817 (1975; Zbl 0315.30036)]. The present paper considers similar criterion for normality of families of functions whose zeros are of degree at least  $k$ , where  $k$  is a positive integer. As an example of how these results can be applied, the authors prove that a family  $\mathcal{F}$  of meromorphic functions is normal if each function  $f \in \mathcal{F}$  has only poles of degree at least  $k + 2$  and satisfies  $f^{(k)} - af^3 \neq b$  everywhere, where  $a$  and  $b$  are fixed complex numbers. This result was established by D. Drasin for holomorphic functions where  $k = 1$ .

Reviewer: S.Dragosh (East Lansing)

**MSC:**

**30D45** Normal functions of one complex variable, normal families  
**30D35** Value distribution of meromorphic functions of one complex variable,  
Nevanlinna theory

Cited in **5** Reviews  
Cited in **35** Documents

**Keywords:**

normal family