Abstract of paper [1].

Let $k \geq 2$ be an integer, and set $E_k(X) := |\{n \leq X : \ n \neq m^k$, n is not a sum of a prime and a k-th power$\}|$. We prove that there exists $\delta = \delta(k) > 0$ such that $E_k(X) \ll_k X^{1-\delta}$, by means of a suitable application of the circle method, essentially a variant of Montgomery & Vaughan's method (Acta Arithmetica 1975). The proof is similar to the one given by Brünner, Perelli & Pintz (Acta Math. Hungarica 1989) in the case $k = 2$, the main new difficulty being in the treatment of the singular series.

References

[1] A. Zaccagnini. On the exceptional set for the sum of a prime and a k-th power. *Mathematika*, 39:400–421, 1992.