Abstract of paper [1].

Let Λ be the von Mangoldt function and $R(n)=\sum_{m_1+m_2=n}\Lambda(m_1)\Lambda(m_2)$ be the weighted counting function for the Goldbach numbers. We prove that for $N\to+\infty$ we have

$$\sum_{n\le N} R(n)\frac{(1-n/N)^k}{\Gamma(k+1)} = \frac{N^2}{\Gamma(k+3)} - 2\sum_{\rho}\frac{\Gamma(\rho)}{\Gamma(\rho+k+2)}N^{\rho+1} + \sum_{\rho_1}\sum_{\rho_2}\frac{\Gamma(\rho_1)\Gamma(\rho_2)}{\Gamma(\rho_1+\rho_2+k+1)}N^{\rho_1+\rho_2} + O_k\Big(N^{1/2}\Big),$$

for $k>1$, where ρ, with or without subscripts, runs over the non-trivial zeros of the Riemann zeta-function $\zeta(s)$.

References

[1] A. Languasco and A. Zaccagnini. A Cesàro average of Goldbach numbers. *Forum Mathematicum*, 27(4):1945–1960, 2015.