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A conjecture of Bateman regarding $r_5(n)$

Paul T. Bateman made a conjecture about the exact formula for $\sum_{|j| \leq n} \sigma(n-j^2)$. Later, he and Knopp proved the conjecture using the theory of half-integral weight modular forms. We present a simpler proof of the conjecture in the case when $n \equiv 1 \pmod{4}$. This is joint work with Prof. Ram Murty.