Exposé court

24 *An extension of the Euclid-Euler theorem to certain α-perfect numbers*

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In a posthumously published work, Euler proved that all even perfect numbers are of the form $2^{p-1}(2^p-1)$, where 2^p-1 is a prime number. In this talk, we extend Euler's method for certain α-perfect numbers for which Euler's result can be generalized. In particular, we use Euler's method to prove that if N is a 3-perfect number divisible by 6; then either $2 \parallel N$ or $3 \parallel N$. As well, we prove that if N is a $\frac{5}{2}$-perfect number divisible by 5, then $2^4 \parallel N$, $5^2 \parallel N$ and $31^2 \mid N$. Finally, for $p \in \{17, 257, 65537\}$, we prove that there are no $\frac{2p}{p-1}$-perfect numbers divisible by p. This is joint work with Paulo J. Almeida.