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A New Family of Gold-like Sequences

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Abstract For n odd, we characterize Gold-like sequences of period 2^n-1 represented by $\sum_{i=1}^{\frac{n-1}{2}} c_i Tr(x^{2^i+1})$, $c_i \in GF(2^n)$ using techniques from linear algebra and coding theory. We find two new classes of primes p for which the above sequence of period 2^p-1 is Gold-like for all choices of coefficients. We also prove that these primes are the only odd integers n with this property. Finally, we prove that the two-term function $Tr(x^{2^i+1}+x^{2^j+1})$ gives Gold-like sequences of period 2^n-1 for all $1 \leq i \neq j \leq \frac{n-1}{2}$ if and only if n is prime.