The covering method for $p$-divisibility of exponential sums over any finite field

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The covering method for polynomials over the prime field $\mathbb{F}_p$ was introduced in papers by Castro and Rubio as an elementary method to compute exact $p$-divisibility of exponential sums. In those papers, the proofs of the results only require elementary methods. In this work we extend the covering method to any field $\mathbb{F}_q$, keeping the simplicity of the results, but the proofs require tools that are no longer elementary.

Keywords: finite fields, exact $p$-divisibility, exponential sums