

An interesting class of Boolean functions are APN functions - these functions are “as far” from linear functions as possible. Most of the quadratic APN functions have the same (=classical) Walsh spectrum - a sort of footprint of the function. The aim of this thesis is to describe a method which might lead to a generalisation of a sporadic example of a quadratic APN function with non-classical Walsh spectrum. Up until recently, it was believed that no such function exists. This was proven to be false in 2009, as an example of such function in dimension 6 was introduced. In this thesis, we describe the construction and then deduce necessary conditions for some free coefficients in order to reduce the search space to a level which enables a computer search.