

On the derivatives of Balanced functions

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Abstract. Some of the derivatives for the most known balanced Boolean functions are constants. The function $f = g(x_1, \dots, x_{n-1}) + x_n$ is one of the well-known such functions and $D_{(0, \dots, 0, 1)}f$ is constant. In this paper we construct some balanced Boolean functions with no constant derivative functions. We also show that any APN function in even dimension must have some components which do not have any constant derivatives where as in odd dimension this need not to be always the case.

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