CUBATURE FORMULAS FOR GAUSSIAN WEIGHTS. OLD AND NEW

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In the first part of this talk some general features of Cubature formulas are recalled. As it is well known, despite what happens in the univariate case (Gaussian Quadrature rules), the problem of getting useful Cubature rules with a prescribed degree of algebraic precision and a reasonable number of nodes is far from being solved. In this sense, we focus on Cubature formulae for integrals with the Gaussian weight in $\mathbf{R}^n$, that is,

$$I(f) = \int_{\mathbf{R}^n} f(\mathbf{x}) \, e^{-\mathbf{x}^T \mathbf{x}} \, d\mathbf{x}.$$

Then, after reviewing some known rules for this kind of integrals, some new ones are introduced and their accuracy is checked by means of some numerical examples.