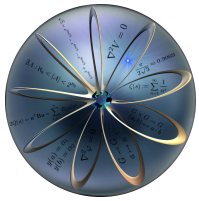

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codifferential

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The codifferential δ of a k-form on an n-dimensional Riemannian manifold is given by:

$$(-1)^{n(k+1)+1} * d*$$

where $*$ is the Hodge star operator and d is the exterior derivative.

Let g denote the matrix locally representing the metric with respect to co-ordinates $x_1, \cdots, x_n$. Then for a 1-form w we have:

$$\delta w = \frac{-1}{\sqrt{(\mathrm{Det} g)}} \frac{\partial}{\partial x_i} \left[\sqrt{(\mathrm{Det} g)} \{g^{-1}\}_{ij} w_j \right]$$