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***A generalization of the exterior product of differential forms
combining Hom-valued forms***

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Abstract: This article deals with vector valued differential forms on C^∞ -manifolds. As a generalization of the exterior product, we introduce an operator that combines $Hom(\otimes^s(W), Z)$ -valued forms with $Hom(\otimes^s(V), W)$ -valued forms. We discuss the main properties of this operator such as (multi)linearity, associativity and its behavior under pullbacks, push-outs, exterior differentiation of forms, etc. Finally we present applications for Lie groups and fiber bundles.

Keywords: differential forms, exterior product, multilinear algebra

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