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Title: The symmetrized covariant derivative

Abstract (joint work with Saugata BANDYOPADHYAY)

Given matrices $\Gamma_1, \dots, \Gamma_n$ and g (g being symmetric), we give necessary and sufficient conditions for the existence of a vector field ψ satisfying

$$\nabla_{\Gamma}\psi + (\nabla_{\Gamma}\psi)^t = g$$

where ∇_{Γ} denotes the covariant derivative. We then give several applications of our result.