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0.1 Metric compatibility

If we have two vectors in the tangent space of a manifold with a metric tensor, we can get a scalar:

$$v^i u^j g_{ij}$$

0.1.1 Transported metric

If we transport two vectors along a connection, we have the metric at the new point.

0.1.2 Metric preserving connections

If the connection preserves the metric, then the connection is metric compatible.