

*This is a review submitted to Mathematical Reviews/MathSciNet.*

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**Author:** Holbrook, John

**Title:** No dice: a deterministic approach to the Cartan centroid.

**MR Number:** MR3027448

**Primary classification:** 47A64

**Secondary classification(s):** 15B48

**Review text:**

An  $m$ -plet  $A$  of positive-definite  $N$  by  $N$  matrices may be assigned a Cartan centroid alias Karcher mean alias geometric mean  $G$ . The author shows that its usual stochastic interpretation may be paralleled by a non-stochastic one, explained in main theorem. It states a certain limiting behavior of compositions of asymmetric averages (of just two matrices) and leads, *i.a.*, to a facilitated proof of the monotonicity of  $G$  with respect to the Loewner (partial) ordering of  $A$ s.