

A CONDITION TO AVOID A PATHOLOGICAL STRUCTURE OF
SUFFICIENT σ -FIELDS

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Abstract: Sufficiency is one of the fundamental concepts of mathematical statistic. For a statistical space $(\Omega, \mathcal{A}, \mathcal{P})$ a σ -field is sufficient if - roughly speaking - it contains the same information regarding the measure class \mathcal{P} as the whole σ -field \mathcal{A} . Burkholder has constructed an example where a nonsufficient σ -field is larger than a sufficient one. We show that if the Boolean algebra of equivalence classes of events is complete (where two events A, B are said to be *equivalent* if $P(A \circ B) = 0$ for two every measures $P \in \mathcal{P}$), then a sub- σ -field \mathcal{G} containing a sufficient sub- σ -field \mathcal{F} of \mathcal{A} is sufficient iff the Boolean algebra of equivalence classes of events belonging to \mathcal{G} is complete.

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