

# Have We Seen a Signal Yet?

## A Necessary Condition for Claiming Discovery

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### **Abstract**

We consider experiments in which events may be either background or signals, and suppose that auxiliary variables have been attached to the events, providing partial information about their nature. The question of interest is whether any signal events are present. We adopt a Bayesian approach and derive an upper bound for the probability that a signal event has been observed that is independent of the prior distribution within broad limits.