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77843-3368. *General witness sets.*

Numerical algebraic geometry has a close relationship to intersection theory from algebraic geometry. We deepen this relationship, explaining how rational or algebraic equivalence gives a homotopy. We present a general notion of witness set for subvarieties of a smooth complete complex algebraic variety using ideas from intersection theory. Under appropriate assumptions, general witness sets enable numerical algorithms such as sampling and membership. These assumptions hold for products of flag manifolds. We introduce Schubert witness sets, which provide general witness sets for Grassmannians and flag manifolds. (Received August 21, 2020)