Information geometry of quantum resources

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Quantum systems exhibit peculiar properties which cannot be justified by classical physics, e.g. quantum coherence and quantum correlations. Once confined to thought experiments, they are nowadays created and manipulated by exerting an exquisite experimental control of atoms, molecules and photons. It is important to identify and quantify such quantum features, as they are deemed to be key resources to achieve supraclassical performances in computation and communication protocols.

I show that information geometry is a useful framework to characterize quantum resources. In particular, it elucidates the advantage provided by quantum systems in metrology tasks as phase estimation. Also, geometric measures of quantum resources are observable. Indeed, they can be evaluated in the laboratory by a limited number of interferometric measurements as well as alternative schemes.