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## Generalized coherent vector: definition and applications

We advance on the characterization of quantum coherence resource theory, by introducing the notion of coherence vector of a general quantum state. We show that the coherence vector completely characterizes the notions of being incoherent, as well as being maximally coherent. Moreover, using this notion and the majorization relation, we obtain a necessary condition for the conversion of general quantum states by means of incoherent operations. Finally, we introduce a family of coherence monotones by considering concave and symmetric functions applied to the coherence vector of a general quantum state. We compare this proposal with the convex roof measure of coherence and others quantifiers given in the literature.

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